



COLONY AND PROTECTORATE OF NIGERIA

REPORT  
ON THE  
Medical and Health  
Services  
FOR THE YEAR  
1934

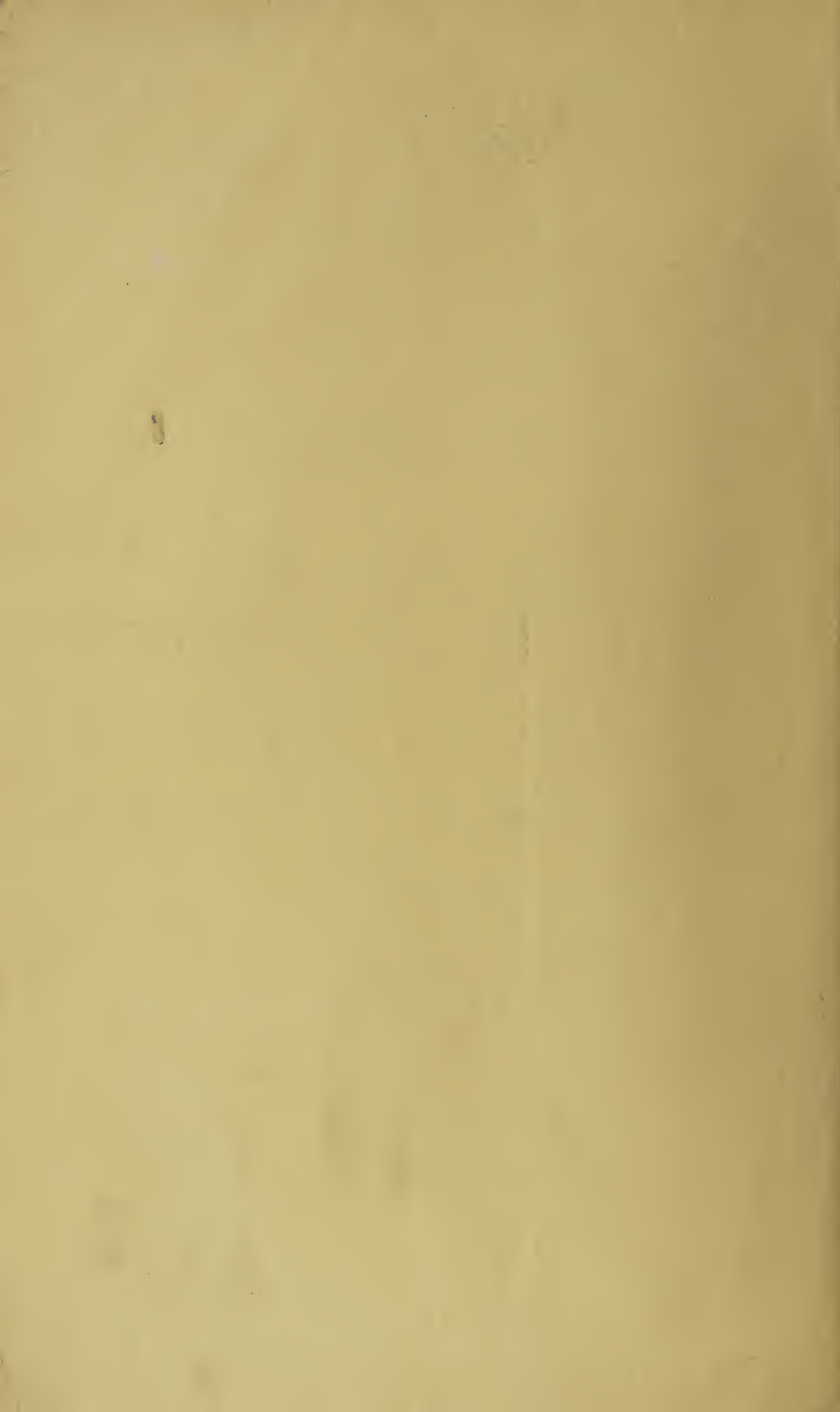
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# Report on the Medical and Health Services for the Year 1934.

## I.—ADMINISTRATION.

### A.—ESTABLISHMENT.

#### (a) EUROPEAN STAFF.

Director of Medical and Sanitary Service.

#### MEDICAL SERVICE :

- Deputy Director.
- Assistant Director.
- 2 Specialists.
- 2 Part-time Consultant Medical Officers.
- 10 Senior Medical Officers—reduced to 9 during year.
- 67 Medical Officers—reduced to 66 during year.
- 3 Lady Medical Officers—reduced to 2 during year.
- 1 Superintendent Medical Schools.
- 1 Superintendent Pharmacy School.
- 1 Assistant Superintendent Pharmacy School.
- 2 Government Dentists.
- 1 Matron—retired during year and not replaced.
- 9 Senior Nursing Sisters.
- 49 Nursing Sisters—reduced to 46 during year.
- 2 Assistant Radiographers and Storekeepers Grade I.
- 1 Assistant Radiographer and Storekeeper Grade II.

#### HEALTH SERVICE :

- Deputy Director.
- Assistant Director.
- 5 Senior Health Officers (one seconded to Lagos Town Council).
- 10 Medical Officers of Health (including Officer i/c Dietetics Research).
- 1 Chief Sanitary Superintendent.
- 2 Sanitary Superintendents, Grade I.
- 30 Sanitary Superintendents, Grade II.

#### LABORATORY SERVICE :

- 1 Senior Pathologist.
- 7 Pathologists, reduced to 5 during year (includes 1 attached to Medical School and i/c Yellow Fever Investigation Unit).
- 1 Senior Technical Assistant.
- 5 Technical Assistants, 1 attached Dietetics Research Unit, 1 i/c Vaccine Laboratory, Vom, 1 attached Medical School.

#### TSETSE INVESTIGATION SLEEPING SICKNESS SERVICE :

- Deputy Director.
- 1 Senior Sleeping Sickness Medical Officer.
- 5 Medical Officers—increased to 6 during year.
- 1 Entomologist.
- 1 Veterinary Pathologist—reverted to Veterinary Department during year.
- 1 Technical Assistant.

#### CLERICAL AND STOREKEEPING STAFF :

- 1 Assistant Accountant.
- 1 Office Assistant.
- 1 Chief Dispenser Storekeeper (3 Assistant Radiographers also act as part-time Storekeepers).



## (b) AFRICAN STAFF.

## MEDICAL SERVICE :

- 8 Medical Officers (increased to 9 during year).
- 3 Junior Medical Officers (reduced to 2 during year).
- 1 Chief Dispenser.
- 7 Senior Dispensers (reduced to 6 during year).
- 20 First-class Dispensers.
- 87 Second-class Dispensers (reduced to 86 during year).
- 18 Dispensers-in-training.
- 27 Medical Students.
- 9 Senior Nurses (reduced to 8 during year).
- 32 Charge Nurses.
- 72 First-class Nurses (reduced to 70 during year).
- 231 Second-class Nurses.
- 140 Nurses-in-training.
- 1 First-class Midwife.
- 8 Second-class Midwives.
- 15 Pupil Midwives.
- 1 Charge Attendant, Lunatic Asylum.
- 25 Attendants, Lunatic Asylum (reduced to 24 during year).
- 6 Attendants, Leper Asylum.
- 3 Senior Wardens.
- 11 Wardens.
- 1 Assistant Warden.

## HEALTH SERVICE :

- 8 First-class Sanitary Inspectors.
- 34 Second-class Sanitary Inspectors.
- 34 Third-class Sanitary Inspectors.
- 13 Sanitary Inspectors-in-training.
- 39 Sub-Inspectors of Sanitation (reduced to 37 during year).
- 64 Vaccinators.

## LABORATORY SERVICE :

- 3 First-class Laboratory Attendants (reduced to 2 during year).
- 7 Second-class Laboratory Attendants (reduced to 6 during year and one seconded Vom).
- 4 Third-class Laboratory Attendants.
- 6 Laboratory Attendants-in-training.

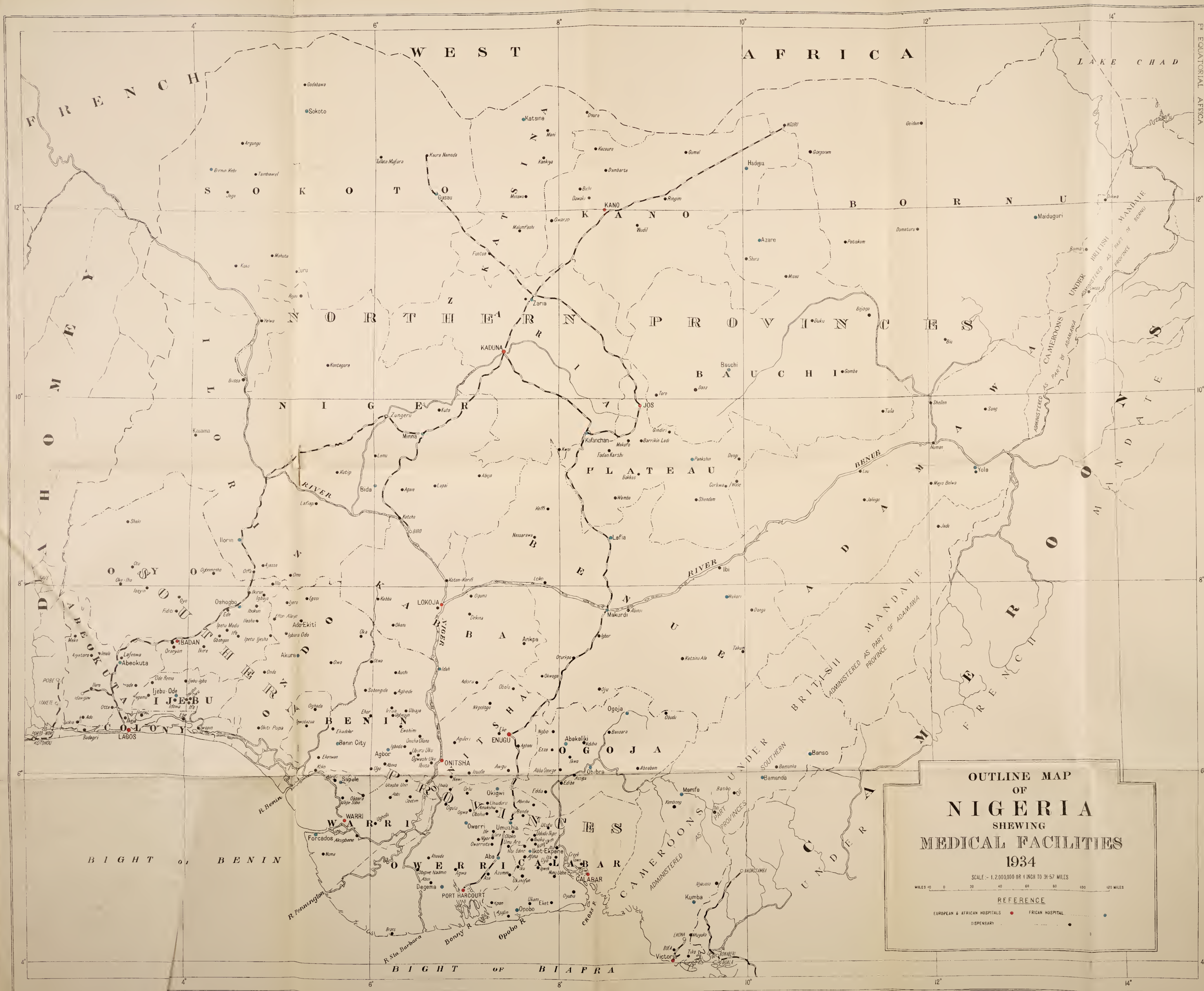
## TSETSE INVESTIGATION AND SLEEPING SICKNESS STAFF :

- 1 First-class Clerk.
- 1 Second-class Clerk.
- 1 First-class Laboratory Attendant.
- 3 Third-class Laboratory Attendants.
- 1 Second-class Dispenser.
- 2 First-class Nurses.
- 9 Second-Class Nurses.

## CLERICAL AND STOREKEEPING STAFF :

- 1 Assistant Accountant.
- 4 Assistant Chief Clerks.
- 11 First-class Clerks.
- 39 Second-class Clerks.
- 1 Chief Storekeeper.
- 2 Assistant Chief Storekeepers.
- 3 First-class Storekeepers.
- 4 Second-class Storekeepers.









## B.—LEGISLATION.

LIST OF ORDINANCES, REGULATIONS, ETC., AFFECTING PUBLIC HEALTH  
ENACTED DURING THE YEAR, 1934.

## ORDINANCES.

Serial No.	Date.	Short Title and application.	Provisions.
20	—	An Ordinance to make provision for the Registration of Medical Practitioners, Dentists and Medical Assistants.	Repealing the Medical Practitioners and Dentists Ordinance and amendments and providing for the registration of Medical Practitioners, Dentists, and Medical Assistants.
21	—	An Ordinance to amend the Dangerous Drugs Ordinance, 1927.	Amending section 12 of the Dangerous Drugs Ordinance.
22	—	An Ordinance to amend the Poisons and Pharmacy Ordinance, 1927.	Amending certain sections of the Poisons and Pharmacy Ordinance, 1927.

## REGULATIONS.

Serial No.	Date.	Ordinance made under.	Provisions.
19	7.8.1934	The Poisons and Pharmacy Ordinance, 1927.	Amending the Poisons and Pharmacy Regulations, 1927 (No. 47 of 1927).
28	15.10.1934	The Anatomy Ordinance, 1933.	Prescribing form for licence to practise Anatomy and forms for certificates for the purposes of sections 5 and 8 of the Anatomy Ordinance.

## ORDERS-IN-COUNCIL.

Serial No.	Date.	Ordinance made under.	Provisions.
7	19.2.1934	The Public Health Ordinance.	Amending Order-in-Council No. 12 of 1923.
10	26.2.1934	The Births, Deaths and Burials Ordinance.	Amending Order-in-Council No. 23 of 1929 by appointing a new burial ground for Africans for the Township of Zaria.
25	16.4.1934	The Births, Deaths and Burials Ordinance.	Amending Order-in-Council No. 23 of 1929 by appropriating a burial ground to the Africans of the Christian Religion, Kaduna Township.
46	26.6.1934	The Public Health Ordinance.	Applying the provisions of the Public Health Ordinance and Rules 1-25, 27 (a), 31-33, 37-39, 41-50, 67-82 and no others, of Rules No. 2 of 1917 to Okigwi.
57	8.10.1934	The Public Health Ordinance.	Applying the provisions of Rules 2-7 of Rules No. 12 of 1918 and any rules amending the same to the Third Class Townships of Burutu and Forcados.
60	5.11.1934	The Births, Deaths and Burials Ordinance.	Amending Order-in-Council No. 23 of 1929 by appropriating a burial ground to Soldiers of the R.W.A.F.F.. Enugu.

## RULE.

12	11.12.1934	The Public Health Ordinance.	Prohibiting the keeping of Cattle within the Township of Ogwashe.
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## C.—FINANCIAL.

	£	s.	d.
Revenue ... ..	8,628	7	0
Approved Expenditure, 1934-35 ... ..	401,771	0	0
Actual Expenditure, 1934 ... ..	384,337	0	7

TABLE I.

## FINANCIAL—CALENDAR YEAR, 1934.

## I.—EXPENDITURE.

	£	s.	d.
(a) Personal Emoluments ... ..	258,439	2	3
(b) Other Charges :—			
(1) MEDICAL.			
Medical, Surgical, Dental and X-Ray			
Equipment and Supplies ... ..	20,029	0	5
Diets, Provisions and Necessaries ... ..	8,781	4	5
	28,810	4	10
(2) HEALTH.			
General Sanitary ... ..	21,499	11	1
(3) GENERAL.			
Railway Transport ... ..	9,647	18	3
Other items under Other Charges ... ..	48,533	2	10
	58,181	1	1
	£366,929	19	3
(c) Special Expenditure :—			
Tsetse Fly Investigation ... ..	11,792	12	11
Plague Expenses ... ..	4,239	1	9
Other items under Special Expenditure ... ..	1,375	6	8
	£17,407	1	4

## SUMMARY.

Personal Emoluments ... ..	£258,439	2	3
Other Charges ... ..	108,490	17	0
Special Expenditure ... ..	17,407	1	4
Total ... ..	£384,337	0	7
Hospital and Medical Receipts ... ..	£7,603	13	1
Births and Deaths Fees ... ..	11	10	0
Fumigation and Deratisation Fees ... ..	66	3	10
Sale of Departmental Stores (Medical) ... ..	947	0	1
Total ... ..	£8,628	7	0

TABLE II.

## FINANCIAL STATEMENT INCLUDING CHARGES FOR INTER-DEPARTMENTAL SERVICES FOR THE YEAR 1934.

REVENUE.	EXPENDITURE.
£ s. d.	£ s. d.
Hospital and Medical Receipts ... ..	Marine Services ... ..
7,603 13 1	1,917 13 3
Births and Deaths Fees ... ..	P.W.D. Services :—
11 10 0	(a) Electric Light ... ..
Fumigation and Deratisation Fees ... ..	(b) Water ... ..
66 3 10	2,961 11 4
Sale of Departmental Stores 947 0 1	Railway Services ... ..
Medical charges against the Nigerian Railway, etc. 16,213 9 5	10,761 12 9
Excess Expenditure over Revenue ... ..	Personal Emoluments ... ..
397,929 18 5	268,610 16 8
£422,771 14 10	Other Charges ... ..
	114,532 12 0
	Special Expenditure ... ..
	17,407 1 4
	£422,771 14 10



## II.—PUBLIC HEALTH.

### A.—GENERAL REMARKS.

The year 1934 opened with no improvement of the financial position and it was again necessary to exercise economy in all branches of medical work. Vacancies in European personnel were not filled, except in a few instances, and the cadre is now considerably reduced. Economies effected during the financial year 1933-34 reduced the estimated expenditure of £432,756 to an actual expenditure of £391,339. For the financial year 1934-35 an estimated expenditure of £401,711 was approved, which sum is £84,229 less than the *actual* expenditure in 1930-31.

The staff of Medical Officers engaged upon purely clinical work will experience some relief when the Medical Assistants who are being trained at the Medical School at Lagos qualify for duty. Six Medical Assistants qualified in January, 1935, and have been posted to the larger hospitals as house surgeons. They will take their diploma examination in three years time and, if successful, will then be appointed as Assistant Medical Officers. A report upon the Medical School and Schools of Pharmacy appears in Appendix C.

The following table shows how general hospital work steadily increases, notwithstanding reduction of staff:—

Total cases treated.					1931.	1932.	1933.	1934.
EUROPEANS :—								
In-patients	...	...	...	...	1,245	1,010	1,030	1,065
Out-patients	...	...	...	...	7,630	5,912	6,058	6,968
Total Europeans	...	...	...	...	8,875	6,922	7,088	8,033
AFRICANS AND OTHER NON-EUROPEANS :—								
In-patients	...	...	...	...	35,738	41,577	45,233	47,947
Out-patients	...	...	...	...	481,759	541,517	570,607	594,555
Total Africans	...	...	...	...	517,497	583,094	615,840	642,502

The above figures do not include patients who received treatment at the dispensaries established by the native administrations. During 1934, 628,065 patients were treated at 231 dispensaries, as compared with 619,188 patients at 226 dispensaries in 1933 and 367,882 patients at 197 dispensaries in 1932.

### I.—GENERAL DISEASES.

A return of diseases and deaths for 1934 is given in Tables IV and V on pages 43 to 62 of this report. The incidence of disease groups is shown in diagramatic form overleaf.

Attention was drawn in the last Annual Report to the prevalence of neurasthenia amongst European residents in Nigeria. The condition was diagnosed in 104 cases during 1934 and was shown as the cause of invaliding in 20% of all European officers who were invalided.

Attention is becoming more and more focussed upon dietetic deficiencies of native foodstuffs, the effects of which appear particularly in school children. It is possible that there is a toxic element in addition to the deficiency element in some diets, especially in the case of cassava and the coco yam. Dr. Fitzgerald Moore drew attention, in an article published in the West African Medical Journal, to the toxic effect of stale or badly prepared cassava, and Dr. A. Clark is working in Nigeria upon the tox-albumen (tannia) of the coco yam. The latter investigation is being financed by a grant made from the Medical Research Council and the Colonial Medical Fund. Work has been continued during the year at the dietetic laboratory upon the values of native foods. The laboratory was moved from Katsina to a more spacious laboratory at Zaria.

## II.—COMMUNICABLE DISEASES.

## 1.—MOSQUITO OR INSECT BORNE.

*Malaria*.—The following table shows hospitalisation figures for malaria and blackwater fever during the past three years:—

			1932.		1933.		1934.	
			Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.
EUROPEANS :—								
Malaria ...	...	...	876	...	928	...	1,025	2
Blackwater ...	...	...	15	1	12	1	16	5
AFRICANS AND NON-EUROPEANS :—								
Malaria ...	...	...	32,895	35	34,594	36	35,486	52
Blackwater ...	...	...	10	2	17	4	20	3

The mortality in European cases of blackwater fever was unusually high, one official and four non-official Europeans dying of the disease during the year.

*Trypanosomiasis*.—A report upon the work of the six sleeping sickness survey teams which have been in the field throughout the year appears as Appendix B. It will be seen that the team examined 831,712 persons during the year and discovered 43,017 cases of trypanosomiasis. In addition 4,613 cases were treated at hospitals and dispensaries throughout the country. At the end of the year a team commenced work in the Tiko area of the Cameroons. In Appendix B the whole position is discussed and plans for the future conduct of the campaign are outlined.

## 2.—INFECTIOUS DISEASES.

Notes upon the incidence of various infectious diseases appear in Section III.

*Venereal diseases and yaws*.—The following table gives the number of African patients who have come under treatment at Government hospitals and dispensaries during the past five years:—

			1930.	1931.	1932.	1933.	1934.
Yaws ...	...	...	39,943	56,346	80,675	86,748	119,728
Syphilis ...	...	...	13,698	17,396	19,481	16,286	13,439
Gonorrhœa ...	...	...	12,940	13,716	12,975	15,180	16,563

In addition to the above 22,280 cases of yaws, 23,684 cases of syphilis and 16,717 cases of gonorrhœa were treated at native administration dispensaries during the year.

At Opobo in the Calabar Province injections of bismuth arsanilate for yaws, with or without N.A.B. treatment also, has practically amounted to mass treatment; over 83,000 injections were given and the incidence of florid yaws has very notably diminished. The “wayside clinic” method of treating yaws by sobita injections was successfully introduced at Mamfe in the Cameroons; and at Bamenda and Bansa, also in the Cameroons, the campaign which was started two years ago has proved a striking success. In this campaign a preliminary survey is made after which men are selected from village groups and are trained in the technique of giving sobita injections.



In the Bamenda district seventy-seven of these trained men, known as Chindas, are at work and roughly 45,000 injections were given by them in addition to some 12,600 injections given at the hospital and dispensaries. At Bansa nineteen Chindas are at work, they treated 6,115 cases, and it is noted that the effect has been to diminish the number of patients who attend hospital for this treatment (940 cases in 1933 as against 219 in 1934).

*Leprosy.*—The average leper population under treatment at leper settlements, which are mostly farm colonies, during 1934 was 4,767 compared with 4,860 in 1933 and 3,561 in 1932. An attempt has been made to restrict admission to the large farm colonies to early treatable cases, and also to make each leper, or the family or a leper patient, contribute towards his support while in the Colony. In the Southern Provinces patients are now required to present a form upon which the Medical Officer has certified that the disease is in an early or treatable stage, and upon which the District Officer has stated that the patient is, or is not, capable of contributing towards his support. It is hoped in this way to make more practical use of the facilities which exist for treatment of lepers during the infectious stage of the disease.

In July a Medical Officer whose salary is being reimbursed to Government, half by the British Empire Leprosy Relief Association and half by Kano Native Administration arrived in Nigeria. He had received special training in Leprosy under Dr. Cochrane in England and first spent some time at the Itu and Uzuakoli Colonies studying the problems of the disease in this country and how they are being met. He then took charge of the developing of the Ossiomo Colony until December when he proceeded to Kano to make arrangements for the establishment of the Kano Leper Colony on the site selected at Sumaila.

During the year a committee of representatives from Toc. H. and the British Empire Leprosy Relief Association dealt with the question of obtaining lay workers for Leprosy Relief in the Empire. The training of selected volunteers was commenced, four of these have been allocated to Nigeria and are expected to be available in July, 1935.

The following table shows the distribution of leper patients amongst the various treatment centres, and gives the indication of the type of colony available :—

GOVERNMENT AND NATIVE ADMINISTRATION.

*Southern Provinces and Colony.*—

Province,	Average Population.
Lagos (Yaba) Asylum ...	62
Ossiomo, Farm Colony ...	128
Uzuakoli, Farm Colony ...	500
Onitsha, Colony ...	101
Kumba, Colony ...	12
Bamenda, Colony ...	131
Abakaliki, Colony ...	51
Bansa, Colony ...	15

*Northern Provinces.*—

Zaria Colony (Mission assisted)	154
Gusau, Colony ...	56
Katsina, Farm Colony ...	313
Azare, Colony ...	86
Maiduguri, Colony ...	230
Bauchi, Colony ...	80



Province.	Average Population.
<i>Medical Missions:</i>	
<i>Southern Provinces.—</i>	
Itenan, Colony ... ..	280
Itu, Farm Colony ... ..	1,450
Ogbomosho, Colony ... ..	29
Uburu, Colony ... ..	150
<i>Northern Provinces.—</i>	
Galengu, Farm Colony ... ..	20
Garkida, Farm Colony ... ..	411
Mkar, Farm Colony ... ..	354
Vom, Colony ... ..	30
Diko, Colony ... ..	24
Total ... ..	4,767

In addition to the above, 1,821 lepers received treatment at Native Administration dispensaries.

At Okigwi in Owerri Province out-patient treatment was given to 721 lepers with 4,019 attendances at eight centres.

During the year lay-workers have been under training in England, they are being sent to Nigeria by a joint Committee of Toc H. and the British Empire Leprosy Relief Association. It is hoped that four of these men will reach Nigeria in July, 1935, when they will be posted to large leper colonies where their services will be of great value.

## B.—VITAL STATISTICS.

### (1) GENERAL POPULATION—AFRICAN.

The census made in 1931 gave an estimated non-European population in Nigeria, including the Cameroons under British mandate, of 19,928,171.

Registration of births and deaths is compulsory only in the Lagos area, the statistics for which are summarised in the following table:—

	1934.		
	Lagos.	Ebute Metta.	Total.
Estimated population (Lagos and Ebute Metta)	—	—	160,000
Total births ... ..	3,417	1,046	4,463
Birth rate per 1,000 population ... ..	—	—	27·89
Total deaths ... ..	1,703	385	2,088
Death rate per 1,000 population ... ..	—	—	13·05
Deaths—Infants under one year ... ..	425	107	532
Infantile mortality per 1,000 births ... ..	124·3	102·29	119·2
Deaths—Children under five years ... ..	668	142	810
Percentage of deaths of children under five years to total deaths ... ..	39·2	36·8	38·7
Deaths—causation of—certified by Medical Practitioners—number ... ..	1,703	385	2,088
Deaths—causation of—certified by Medical Practitioners—per cent ... ..	100%	100%	100%
Deaths under one year—certified by Medical Practitioners—number ... ..	425	107	532
Deaths under one year—certified by Medical Practitioners—per cent ... ..	100%	100%	100%
Deaths uncertified by Medical Practitioners—number ... ..	—	—	—
Deaths uncertified by Medical Practitioners—per cent ... ..	—	—	—
Total stillbirths ... ..	95	20	115
Stillbirths—proportion per cent of the total births (normal and stillbirths) ... ..	2·7	1·8	2·5

The following summary enables comparison to be made with previous years of births, deaths and infant mortality rates in the Lagos area :—

Year.	Total Births.	Birth Rate.	Total Deaths.	Death Rate.	Infant Mortality.
1909 ... ..	2,576	42·4	2,259	32·7	315
1919 ... ..	2,517	30·2	2,256	27·0	296
1927 ... ..	3,305	28·9	2,312	20·2	174·9
1928 ... ..	3,330	28·1	2,439	20·5	138·1
1929 ... ..	3,451	28·2	2,141	17·5	134·1
1930 ... ..	3,494	28·6	2,016	16·5	129·07
1931 ... ..	3,451	24·6	1,776	12·6	111·8
1932 ... ..	3,863	27·5	1,819	12·9	101·7
1933 ... ..	3,882	24·93	2,156	13·85	137·3
1934 ... ..	4,463	27·8	2,088	13·05	119·2

## (2) GENERAL POPULATION—EUROPEAN.

Table showing estimated European population during the years 1932, 1933 and 1934 :—

1932.				
Remaining on 31/12/32	...	...	...	4,375
Deaths during 1932	...	...	...	21
1933.				
Remaining on 31/12/33	...	...	...	4,729
Deaths during 1933	...	...	...	30
1934.				
Remaining on 31/12/34	...	...	...	5,021
Deaths during 1934	...	...	...	30

## EUROPEAN NON-OFFICIALS.

### CAUSES OF INVALIDINGS AND DEATHS.

Government returns for the year 1934 show that twenty-three European non-officials were invalided, as compared with seventeen in 1933 :—

Malaria, 3; blackwater fever, 1; dysentery, 1; fracture femur, 1; filaria, 1; neurasthenia, 2; glaucoma, 1; appendicitis, 1; furunculosis, 1; submucous fibroid, 1; eczema, 1; acute prostatitis, 1; portal cirrhosis, 1; tuberculosis, 2; mental aberration, 1; anorexia, 1; gout, 1; gastritis, 1; tonsillitis, 1.

The number of deaths among European non-officials was fifteen as compared with twelve in 1933 :—

Blackwater fever, 4; nephritis, 1; fracture pelvis, 1; myocarditis, 2; uræmia, 1; neurasthenia and shock, 1; influenza, 1; pleurisy, 1; malaria, 1; acute septic pharyngitis, 1; suicide, 1.

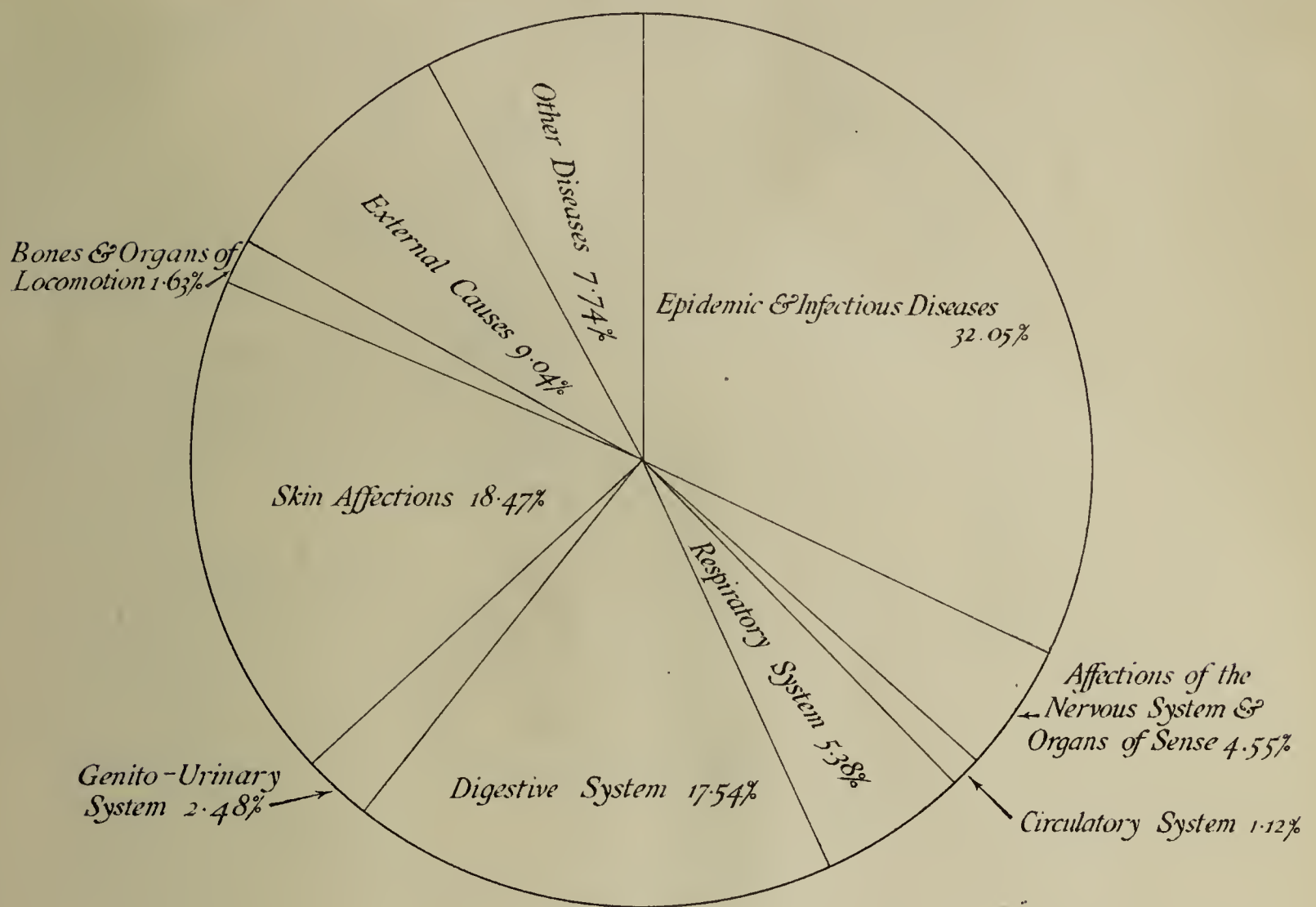
## (3) EUROPEAN OFFICIALS.

Table showing sick, invaliding and death rates of European officials for 1932, 1933 and 1934 :—

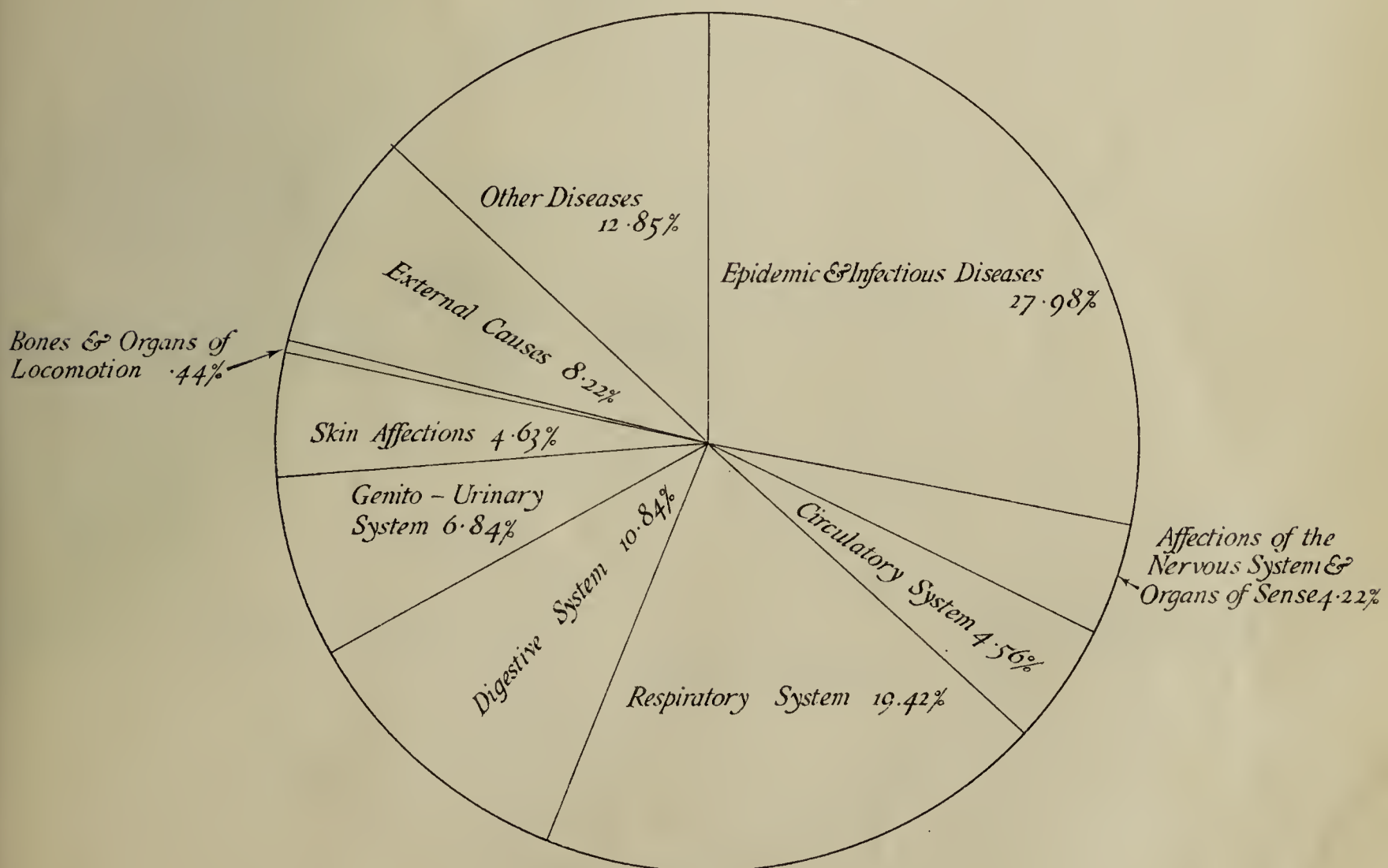
	1932.	1933.	1934.
Total number resident ... ..	1,709	2,095	2,107
Average number resident ... ..	1,641	1,586	1,508
Total number on sick list ... ..	1,294	1,117	996
Total number of days on sick list ... ..	10,440	8,984	10,039
Average daily sick ... ..	28·6	24·6	27·5
Percentage of daily sick to average number resident ...	1·7	1·5	1·8
Average number of days on sick list to each patient ...	8·06	8·04	10·07
Average sick time to each resident ... ..	6·1	4·2	4·7
Total number invalided ... ..	114	100	100
Percentage of invalided to number resident ... ..	6·6	4·7	4·7
Percentage of invalided to average number resident ...	6·9	6·3	6·6
Total deaths ... ..	5	5	8
Percentage of deaths to number resident... ..	·29	0·23	·37
Percentage of deaths to average number resident ...	·30	0·31	·53



GENERAL SYSTEMIC & PREVENTABLE DISEASES  
TREATED IN GOVERNMENT INSTITUTIONS  
TOTAL CASES 650,535  
1934



TOTAL DEATHS 2,981



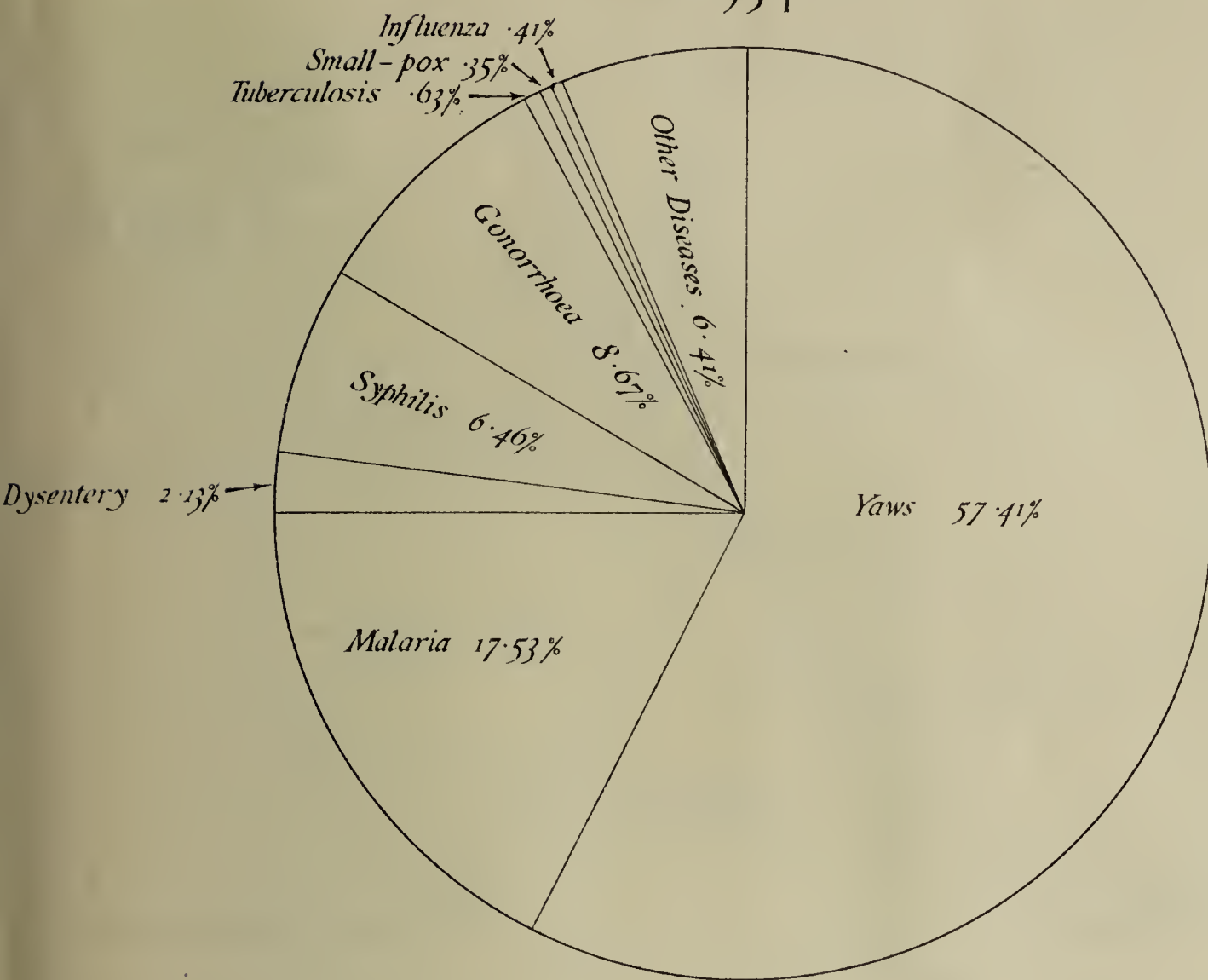




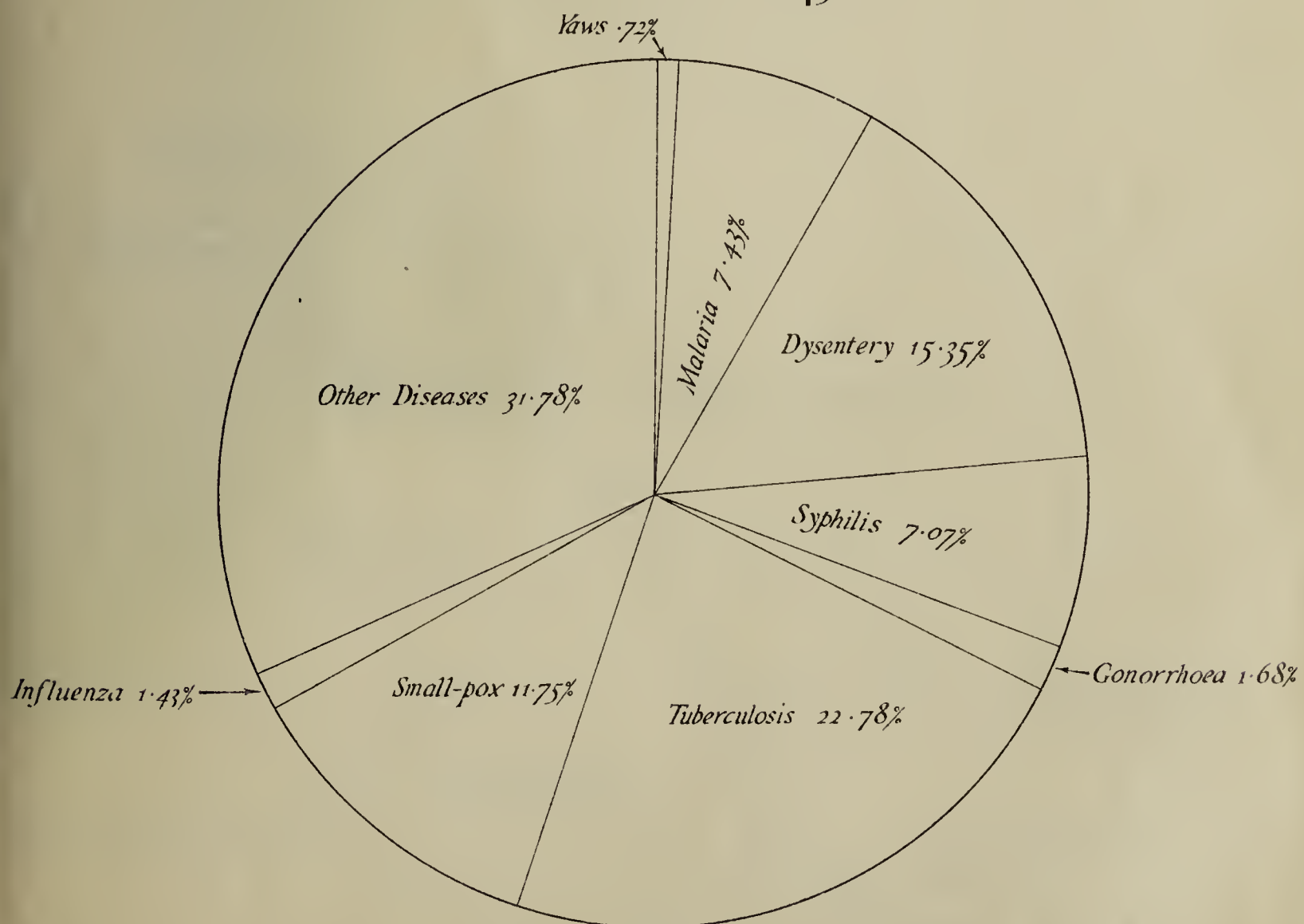
EPIDEMIC, ENDEMIC & INFECTIVE DISEASES  
TREATED IN GOVERNMENT INSTITUTIONS

TOTAL CASES 208,518

1934



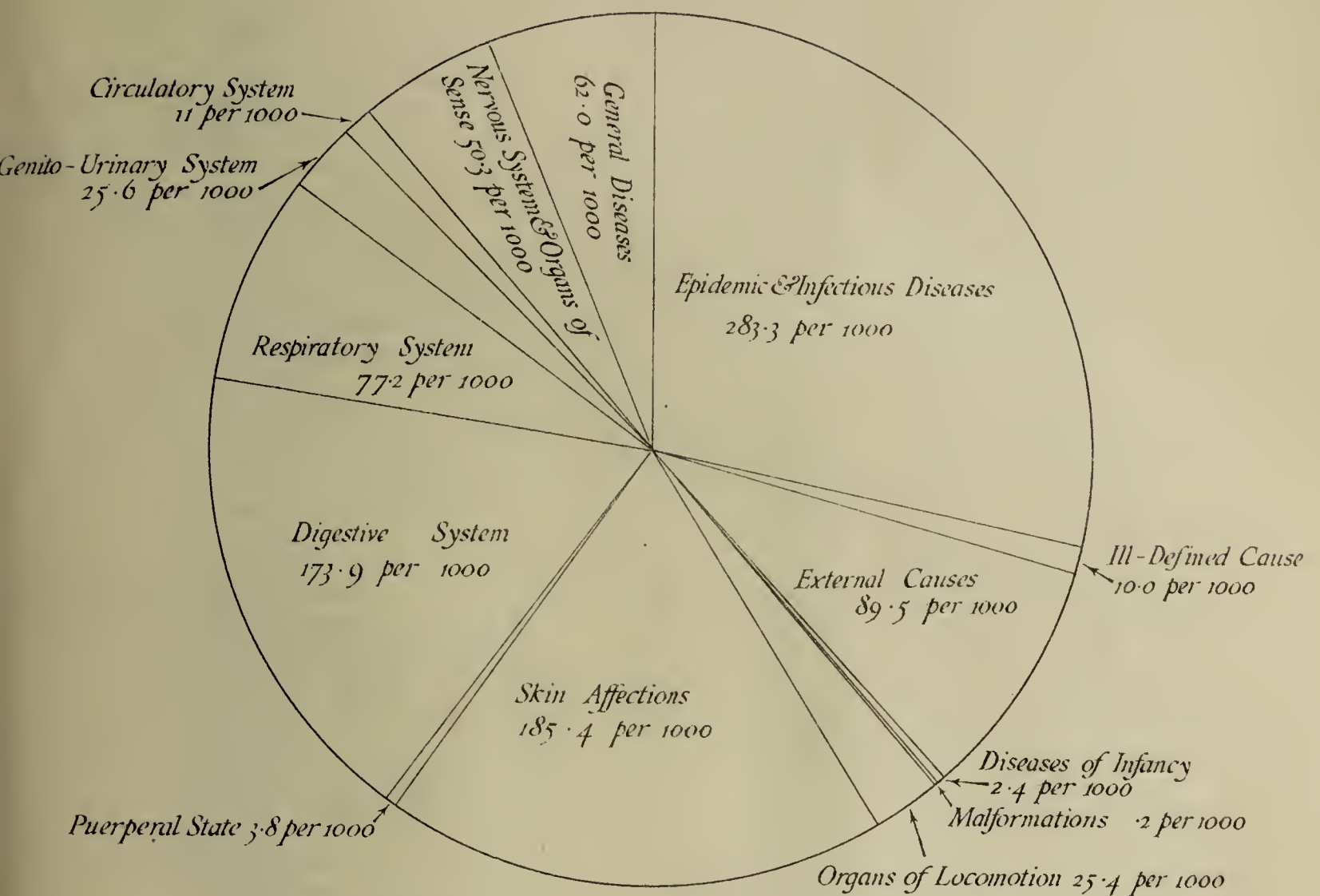
TOTAL DEATHS 843



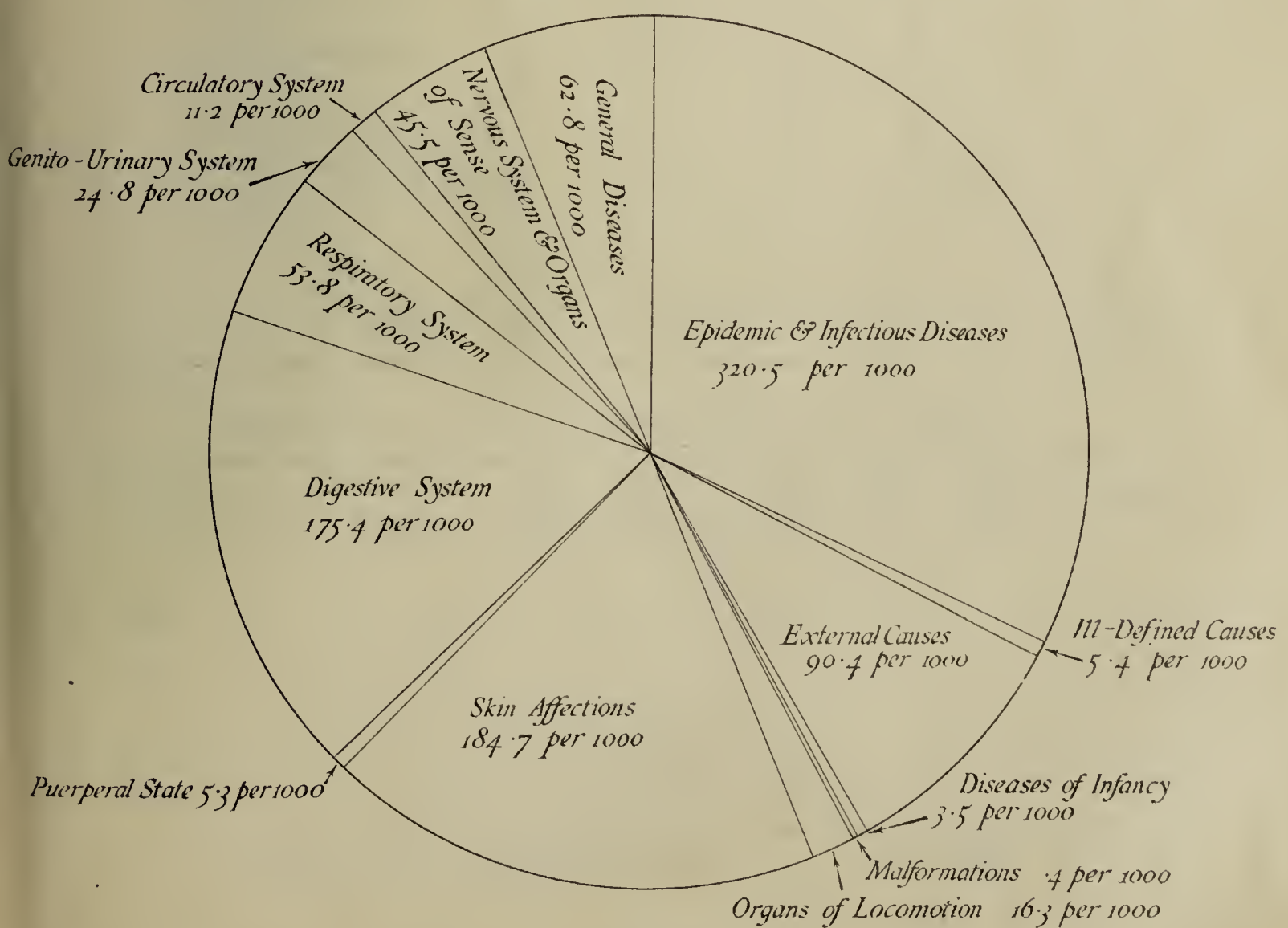




COMPARATIVE DIAGRAMS OF DISEASE GROUPS  
TREATED IN GOVERNMENT INSTITUTIONS  
1933 & 1934



1933



1934



## INVALIDINGS AND DEATHS—EUROPEAN OFFICIALS.

Disease.				Invalids.	Deaths.
Malaria (unspecified) ...	...	...	...	7	—
Malaria—Subtertian ...	...	...	...	2	—
Malaria A.A. (cerebral) ...	...	...	...	—	1
Malarial Cachexia ...	...	...	...	1	—
Blackwater Fever ...	...	...	...	—	1
Diphtheria ...	...	...	...	—	1
Influenza ...	...	...	...	1	—
Dysentery ...	...	...	...	1	—
Yellow Fever ...	...	...	...	1	—
Dengue ...	...	...	...	2	—
Pulmonary Tuberculosis ...	...	...	...	1	—
Tumour (undefined) ...	...	...	...	1	—
Chronic Rheumatism ...	...	...	...	2	—
Anæmia ...	...	...	...	4	—
Alcoholism ...	...	...	...	1	—
Cerebral Haemorrhage ...	...	...	...	1	—
Embolism of Lung ...	...	...	...	1	—
Coronary Thrombosis ...	...	...	...	—	1
Mental Alienation ...	...	...	...	3	—
Hysteria ...	...	...	...	1	—
Neurasthenia ...	...	...	...	20	—
Eye diseases ...	...	...	...	4	—
Otitis media ...	...	...	...	3	—
Valvular disease of heart ...	...	...	...	—	1
Myocarditis ...	...	...	...	1	1
Varicose veins ...	...	...	...	1	—
Rhinitis ...	...	...	...	1	—
Bronchitis ...	...	...	...	1	—
Broncho Pneumonia ...	...	...	...	1	—
Lobar Pneumonia ...	...	...	...	2	1
Caries ...	...	...	...	1	—
Pyorrhoea ...	...	...	...	2	—
Tonsillitis ...	...	...	...	1	—
Septic Pharyngitis ...	...	...	...	—	1
Corneal Ulcer ...	...	...	...	1	—
Duodenal Ulcer ...	...	...	...	2	—
Gastritis ...	...	...	...	4	—
Dyspepsia ...	...	...	...	2	—
Ascariasis ...	...	...	...	1	—
Filariasis ...	...	...	...	1	—
Appendicitis ...	...	...	...	2	—
Jaundice ...	...	...	...	1	—
Urinary Calculus ...	...	...	...	1	—
Cellulitis ...	...	...	...	1	—
Periostitis ...	...	...	...	1	—
Other diseases of Bones ...	...	...	...	1	—
Burns (ammonia) ...	...	...	...	1	—
Injuries (motor accident) ...	...	...	...	1	—
Asthenia ...	...	...	...	12	—
Total ...				100	8

## RECAPITULATION BY COMPLETED MONTHS OF SERVICE.

Leave conditions.			Under 6 months.	Under 9 months.	Under 12 months.	Under 15 months.	Under 18 months.	Over 18 months.	Total.
New	...	...	15	6	3	30	40	2	96
Old	...	...	3	1	—	—	—	—	4
Total	...	...	18	7	3	30	40	2	100

Strength of officers under new leave conditions ... .. 1,896  
 " " " " old " " ... .. 93



(4) SUMMARY OF THE CAUSES OF INVALIDINGS AND DEATHS OF  
AFRICAN OFFICIALS, 1934.

	Invalidings.	Deaths.
Paratyphoid Fever ... ..	—	1
Small-pox ... ..	—	4
Leprosy ... ..	1	—
Acute anterior poliomyelitis ... ..	1	—
Varicella ... ..	—	1
Pulmonary Tuberculosis ... ..	11	—
Syphilis ... ..	—	1
Chronic Gonorrhœal Arthritis ... ..	1	—
Granuloma venereum ... ..	1	—
Septicæmia ... ..	—	2
Cerebral softening ... ..	1	—
Diseases of the eye ... ..	4	—
Valvular disease of the heart ... ..	4	—
Cardiac failure ... ..	1	2
Myocarditis ... ..	4	2
Phlebitis ... ..	—	1
Broncho Pneumonia ... ..	—	2
Lobar Pneumonia ... ..	—	6
Enteritis ... ..	—	2
Stricture ... ..	1	—
Peritonitis ... ..	—	1
Nephritis ... ..	—	1
Arterio Sclerosis ... ..	1	—
Arthritis ... ..	1	—
General Debility ... ..	2	—
Senile Decay ... ..	1	—
Delusional Insanity ... ..	2	—
Melancholia ... ..	1	—
Optic Atrophy ... ..	2	—
Meningitis ... ..	—	1
Septic Tonsillitis ... ..	—	1
Mental Alienation ... ..	1	—
Hyperkeratosis of Feet ... ..	1	—
Injury ... ..	1	1
<b>Total</b> ... ..	<b>43</b>	<b>29</b>

SOLDIERS—NIGERIA REGIMENT—R.W.A.F.F.

Average daily strength ... ..	3,094
Total number on sick list ... ..	7,116
Total number of days on sick list ...	38,525
Average daily sick ... ..	195
Total number of deaths ... ..	24
Death rate per thousand ... ..	7.75
Number invalided during the year ...	50

During 1933 the number invalided during the year was sixty-six, the number of deaths was twenty and the death rate per thousand was 6.4.

POLICE FORCE—NIGERIA.

Average daily strength ... ..	3,548.31
Total number on sick list ... ..	3,496
Total number of days on sick list ...	22,632
Average daily sick ... ..	62.00
Total number of deaths ... ..	32
Death rate per thousand ... ..	9.01
Total number invalided ... ..	33

During 1933 the number invalided during the year was thirty-five, the number of deaths was thirty-three and the death rate per thousand was 9.2.

## STATISTICAL TABLES.

The following statistical tables, numbered according to the type scheme submitted by the Department of Bio-Statistics of the London School of Hygiene, are rendered as far as information is available:—

## TABLES IV AND V.

## BIRTHS AND BIRTH RATES AND STILLBIRTHS.

Estimated Population.	PROVINCE OR DISTRICT.				
	Whole of Nigeria.		Lagos Area including Ebute Metta.		
European and Whites ...	...	†4,130	†1,069		
Other Non-Natives and Africans ...	...	*19,928,171	†160,000		
LIVE BIRTHS.					
<i>European and Whites:—</i>					
Male ...	...	...	18	5	
Female ...	...	...	18	7	
Total ...	...	36	12		
Rate per 1,000 population ...	...	8·7	11·2		
<i>Other Non-Natives and Africans:—</i>			Lagos.	Ebute Metta.	Total.
Male ...	...	...	1,714	530	2,244
Female ...	...	...	1,703	516	2,219
Total ...	...	...	3,417	1,046	4,463
Rate per 1,000 population ...	...	...	—	—	27·89
STILLBIRTHS.					
<i>Other Non-Natives and Africans:—</i>					
Male ...	...	...	44	8	52
Female ...	...	...	51	12	63
Total ...	...	...	95	20	115
Rate per 1,000 population ...	...	...	—	—	·718

\* 1931 Census. † Estimated population at mid-year 1933.  
‡ " " at 1934.

## TABLE VII.

## DEATHS AND DEATH RATES.

Deaths.	PROVINCE OR DISTRICT.			
	Whole of Nigeria including Lagos Area.	Southern Provinces.	Northern Provinces.	Lagos Area including Ebute Metta.
(POPULATION)	†4,130	†1,662	†1,399	†1,069
<i>European and Whites:—</i>				
Male ...	26	5	13	8
Female ...	6	1	4	1
Total ...	32	6	17	9
Crude rate per 1,000 living ...	7·74	3·61	12·15	8·41
<i>Other Non-Natives and Africans:—</i>				
Male ...	—	—	Lagos. 940	Ebute Metta. 192
Female ...	—	—	763	193
Total ...	—	—	1,703	385
Crude rate per 1,000 living ...	—	—	—	13·05

† Estimated population at mid-year, 1933.



TABLE IX.

CAUSES OF DEATH BY SEX AND AGE-PERIODS.

OTHER NON-NATIVES AND AFRICANS, LAGOS AND EBUTE METTA—FOR YEAR 1934.

Ages at Death.	All Causes.		SPECIFIC CAUSES OF DEATH.													
	Male.	Female.	Enteric Group.		Malaria.		Dysentery.		Tuberculosis of Respiratory System.		Other Tuberculous Diseases.		Cancer Malignant.		Pneumonia, all forms.	
			Male.	Female.	Male.	Female.	Male.	Female.	Male.	Female.	Male.	Female.	Male.	Female.		
All ages* ...	1,132	956	1	...	51	52	20	15	84	57	29	15	13	17	203	129
0-1 ...	295	237	...	...	25	21	1	...	1	...	...	...	...	...	56	47
1-5 ...	145	133	...	...	23	27	...	3	1	...	5	3	...	...	47	36
5-10 ...	31	40	...	...	2	3	1	2	1	3	5	5	...	1	7	6
10-15 ...	31	25	...	...	1	...	...	1	1	5	3	...	...	...	8	2
15-25 ...	68	71	..	...	...	...	3	2	8	9	5	1	1	...	16	6
25-35 ...	148	90	1	...	...	...	5	2	33	23	7	3	3	1	23	10
35-45 ...	121	62	...	...	...	1	5	2	17	9	1	3	2	2	19	8
45-55 ...	72	41	...	...	...	...	4	1	14	3	1	...	3	5	12	5
55-65 ..	52	31	...	...	...	...	...	...	3	4	...	...	1	4	10	3
65-75 ...	66	72	...	...	...	...	1	1	4	1	2	...	2	2	3	4
75 and over	103	154	...	...	...	...	...	1	1	...	...	...	1	2	2	2

\* Total.

TABLE X.

## SEASONAL INCIDENCE OF MORTALITY DEATHS—YEAR 1934.

Mon <sup>th</sup> .	DEATHS.								
	EUROPEANS AND WHITES (Whole of Nigeria).			OTHER NON-NATIVES AND AFRICANS (Lagos Area).					
				Male.		Female.		Total.	
	Male.	Female.	Total.	Lagos.	Ebute Metta.	Lagos.	Ebute Metta.	Male.	Female.
January... ..	1	...	1	72	12	65	7	84	72
February ... ..	2	...	2	85	14	76	13	99	89
March ... ..	3	...	3	77	16	56	13	93	69
April ... ..	3	1	4	74	11	54	14	85	68
May ... ..	...	1	1	77	19	66	17	96	83
June ... ..	3	...	3	73	13	62	16	86	78
July ... ..	...	...	...	96	14	76	18	110	94
August ... ..	4	...	4	88	21	79	15	109	94
September ... ..	3	...	3	65	16	51	21	81	72
October ... ..	1	1	2	77	20	64	17	97	181
November ... ..	5	2	7	81	16	49	20	97	69
December ... ..	1	1	2	75	20	65	22	95	87
Total ... ..	26	6	32	940	192	763	193	1,132	956

## III.—HYGIENE AND SANITATION.

## A.—GENERAL REVIEW OF WORK DONE AND PROGRESS MADE.

## I.—PREVENTIVE MEASURES.

(i) *Mosquito and Insect-Borne Diseases.*

*Malaria*.—Although no major drainage or other works have been possible, general anti-malaria measures have been carried out as in previous years. These consist chiefly of the use of Paris green and larvicidal oils, canalisation of streams, extension and maintenance of ditching, and drainage or reclamation of borrowpits.

In the vicinity of Lagos extensive areas of the township have in recent years become more favourable to mosquito breeding owing to indiscriminate felling of trees for firewood or charcoal burning or as a preliminary to farming. In this way much thick, comparatively dry bush has been converted into open flat stretches which are often flooded and which are covered with a coarse grass (*Paspalum vaginatum*). Such areas speedily become extensive breeding places of *Anopheles gambiae*. Action has been taken to put a stop to this dangerous form of clearing and measures of reafforestation are being undertaken.

The Medical Officer of Health, Lagos, records a striking example of the production of swampy conditions resulting from tree felling and bush clearing at Apapa. Here a long narrow swamp was effectively drained by means of a central ditch cut a few years ago leaving thick bush on either side. The ground along the south side of the ditch has since been cleared for farming with the result that it is now a collection of numerous water-holding depressions, whereas the north bank, which is still thickly covered with bush, remains quite dry.

*Trypanosomiasis*.—In the Southern Provinces, the Southern Cameroons around Tiko and the Ahoada Division of the Owerri Province are the only known epidemic centres of sleeping sickness,



but isolated cases are not infrequently reported from other areas, chiefly east of the Niger. Full details of the work of the sleeping sickness teams will be found elsewhere in this report.

*Yellow Fever.*—An outbreak of yellow fever occurred in the Kano Province in November and December. On November 21st an administrative officer, who had been touring in the Gaya district, about forty miles to the east of Kano, was admitted to hospital suffering from an undefined fever, which was subsequently confirmed as yellow fever by a protection test. On November 27th a Frenchman, who had been in residence since the end of October at Ringim, a town forty-four miles from Kano on the railway line to Nguru, died in Kano hospital after an illness of nine days. As a result of a post-mortem examination a diagnosis of yellow fever was eventually established after specimens had been submitted to the Wellcome Bureau of Scientific Research. On December 1st a third European, living in the residential area at Kano, was admitted to hospital suffering from an illness which was subsequently proved by protection test to have been yellow fever.

In consequence of these European cases a careful scrutiny of African fever cases was made and six were reported as suspected. Subsequently two of these gave a positive protection test, in one no definite result was obtained, and three were negative. It is impossible to state with certainty that any of these were cases of yellow fever.

The proved cases were therefore three Europeans of which one was fatal.

As soon as yellow fever in Kano was definitely diagnosed, the Township and Government station of Nasarawa were declared an infected area on 25th December. A mosquito survey showed that while the *ædes* index in the township was practically nil, extensive breeding was going on in certain large collections of huts which had been allowed to remain in the neutral zone when the residential area was established. These buildings were accordingly evacuated and demolished, the occupants were compensated and such of them as desired it were rehoused in a new village built by the Native Administration outside the area. Severe harmattan continued throughout the period and this had a marked effect in reducing the number of mosquitoes in the district and so no doubt cut short the outbreak.

The usual action was taken as regards medical inspection and surveillance of persons leaving the infected area.

During the months of November and December there was an exceptionally large influx of people from over the northern border into the Katsina and Kano Provinces. As yellow fever was known to be prevalent at Zinder and elsewhere to the northward between August and October, it is possible that the infection came from that direction. The three European cases reported from Kano, Ringim, and the Gaya district were no doubt an indication of widespread infection of the African population in the northern part of the province, perhaps for the most part subclinical in character.

Apart from the notification of single suspected cases at Mamfe and Ife, in neither of which was the diagnosis confirmed, no yellow fever was reported in the Southern Provinces. The mosquito indices in some of the towns of the Oyo Province, notably Ibadan and Oshogbo, are regrettably high throughout the year. A proper water supply for Ibadan is one of the most pressing public health needs of Nigeria, and the postponement of such a work for financial reasons connected with the native administration is much to be deplored.

*Relapsing Fever.*—No outbreak was reported anywhere in Nigeria. Provision for disinfestation exists in most of the hospitals and prisons.



(ii) *Epidemic Diseases.*

*Plague.*—No case of plague, either human or rodent, was reported anywhere in Nigeria during the year. Anti-plague measures as before have been continued in Lagos and in the Ijebu and Abeokuta Provinces. Systematic examination of rodents is carried out in Lagos, Port Harcourt, and the Ijebu and Abeokuta Provinces.

*Smallpox and Vaccination.*

(a) *Northern Provinces.*—Smallpox occurred in epidemic form in the Katsina and Sokoto Provinces, in the Katagum division of the Bauchi Province, on the Benue, and in numerous smaller outbreaks throughout the country. Altogether 8,327 cases were reported with 2,153 deaths.

A very successful vaccination campaign was carried out in the Katagum division of Kano Province by a Medical Officer and a Sanitary Superintendent with a team of sixteen Vaccinators. Here it was found that roughly fifty-five per cent of the adult population and twenty-six per cent of the child population up to the age of ten years had previously suffered from smallpox. Attention was therefore confined mainly to the vaccination of those under sixteen. Fortunately the adult Hausas while strongly objecting to being vaccinated themselves are quite willing to have their children done. It is hoped that in this area of the Northern Provinces, where smallpox has been most persistent, the child population will soon be almost completely immune.

Administrative and Medical Officers continue to stress the importance of child vaccination, use being made whenever possible of the Native Administration dispensaries, and in all the larger towns vaccination based on the birth returns is now in operation.

Fortunately the local manufacture of calf lymph at the Veterinary headquarters at Vom, to which reference was made in the last Annual Report, has proved an unqualified success. With a cheap supply of lymph locally manufactured it is now for the first time possible to meet all requirements. The Health Service is greatly indebted to the Chief Veterinary Officer for the provision of laboratory accommodation, a supply of calves, and other facilities so freely given.

232,453 vaccinations were performed in the Northern Provinces as compared with 195,951 in 1933, but a much greater rate of increase will be required before any marked effect on the incidence of smallpox can be looked for.

(b) *Southern Provinces.*—The epidemic in the Ijebu Province which began in 1933 lasted until about the middle of 1934, and 496 cases with 130 deaths were reported during the year. The main difficulties encountered by those engaged in preventive operations in this area arose from the continued popularity of *Shopona* (smallpox) worship, which persisted despite severe penalties inflicted on those whose practice of the cult could be proved. Eventually the epidemic was brought to an end by an intensive and systematic vaccination campaign throughout the province in the course of which over a quarter of a million vaccinations were performed. It is satisfactory to record that many of the more educated people in the larger towns gave invaluable help to the health staff in their efforts to stamp out the disease. When education becomes more general little more will be heard of *Shopona* worship and other such dark cults.

In the Oyo Province the disease appeared early in the year at Ibadan and rapidly reached epidemic proportions, spreading widely throughout the province. In addition to the regular vaccination staff Government and Pupil Sanitary Inspectors were employed and considerable assistance was rendered by the Administrative staff. By the end of May the epidemic was over and since that time there have only been a few sporadic cases.



In Lagos 122 cases of smallpox were notified during the year with twenty deaths. 116 of the cases were treated at the Infectious Diseases Hospital. Of these two came from unknown addresses, sixty-eight from addresses in the township, and forty-six from addresses outside the township, mostly from the Agege district. Owing to the movements of the population it was difficult in many cases to ascertain accurately where the infection was contracted.

East of the Niger there was an increase as compared with recent years, but no epidemic of any size, the most important outbreaks being at Bonny in February and at Port Harcourt during June and July. Infection at Port Harcourt is believed to have been introduced from Lagos and was centred in the Yoruba quarter, cases in the convalescent stage being discovered when a house to house search was carried out in that area.

In the whole of the Southern Provinces 2,062 cases of smallpox with 385 deaths were reported during the year as compared with 1,494 cases with 234 deaths in 1933.

*Vaccination:*

Number of vaccinations performed	1,005,835
Number inspected for results ...	469,829
Number successful ... ..	383,406
Percentage successful ... ..	81.6

*Cerebro-Spinal Fever.*—This disease has happily been absent in epidemic form and only one or two isolated cases were notified. One such was the servant of a policeman at Aba, who had lived in the barracks there for a considerable period. All possible precautions were taken as soon as the clinical diagnosis was made, and although he had at the onset of his illness been admitted to a general ward in the hospital, no further case occurred amongst the contacts there or in the barracks.

*Diphtheria.*—Two European cases, one fatal, were reported in the Northern Provinces, one from the Shendam division, the other from Dikwa. In the fatal case the patient had been in contact with a pony which had a profuse nasal discharge. Swabs were taken from the pony, but neither direct examination nor culture revealed anything pathogenic.

In Lagos the Senior Pathologist and Medical Officer of Health carried out a series of Schick tests on African children. 1,454 children under the age of ten showed Schick—positive percentages of from fifteen to thirty, while 298 over ten yielded only two per cent. Though clinical diphtheria is almost unknown in the African in Nigeria, natural immunisation by subclinical infection appears to be active.

*Tuberculosis.*—Owing to the lack of reliable vital statistics throughout the country there is little information available about the incidence of tuberculosis except in Lagos where all deaths are certified by medical practitioners.

DEATHS IN LAGOS CERTIFIED AS DUE TO TUBERCULOSIS, 1925-34.

				Pulmonary tuberculosis.	Tuberculosis of other organs.	Disseminated tuberculosis.	Total.	Percentage to total deaths.
1925	...	...	...	77	3	7	87	3.1
1926	...	...	...	82	15	4	101	3.3
1927	..	...	..	99	13	27	139	5.9
1928	...	..	...	128	20	16	164	7.1
1929	...	...	...	136	16	7	159	7.4
1930	...	...	...	133	11	6	150	7.4
1931	...	...	...	131	18	28	177	9.8
1932	...	...	...	131	29	19	179	9.7
1933	...	...	...	124	11	14	149	6.8
1934	...	...	...	141	21	23	185	8.8



Little is known of the strains responsible for the disease in Lagos or of the source from which each infection is contracted. It is hoped at an early date to institute some investigations into the matter with the study of selected contacts.

*Rabies.*—There were no cases of human rabies reported during 1934.

Canine rabies appears to be on the increase and many outbreaks were reported and 111 non-European received prophylactic courses of vaccine, the biting animals which were proved positive being forty-eight dogs and two cats.

*Enteric Fever.*—Fevers of the enteric group are seldom or never reported in epidemic form in Nigeria, but every year sporadic cases are reported from various stations in sufficient number to justify the recommendation that Europeans coming to the country should be immunised. The introduction of a water-carriage system of nightsoil disposal in the townships as funds permit would remove one obvious source of infection.

*Pneumonia.*—The pneumonias, especially broncho-pneumonia, continue to take a heavy toll of life, especially of infants. In Lagos they were responsible for 15.6% of deaths at all ages and 19.7% of infant deaths. Helminthic infestations no doubt play a contributory part. In some cases the organism shows extraordinary virulence and the disease may prove rapidly fatal. Occasionally the presence of jaundice has caused a suspicion of yellow fever.

*Minor Epidemic Diseases.*—Measles and mumps appear to have been more prevalent than usual in the Southern Provinces, especially in the Aba and Opobo areas.

### (iii) *Helminthic Diseases.*

Helminthic disease of one sort or another is prevalent on a vast scale throughout Nigeria, and until both public and personal hygiene have advanced far beyond their present stage it is idle to expect any serious abatement of these infestations. This can only be achieved by a gradual process of education.

The Medical Officer of Health, Kano, confirmed the observation of Archibald that an emulsion of the desert date (locally called Aduwa) is lethal for the local snails. He found, however, that it was quite ineffective for Cyclops, which was able to live for four or five days in a concentrated solution.

In Bauchi 600 seedlings were planted round the 150 borrow pits, and in Bida 8,000 were planted along the banks of the river.

In a special investigation for schistosomiasis at Mbolle in the Okrika area of the Owerri Province it was found that out of 300 persons examined, including 150 school children, ova of *S. hæmatobium* were present in thirty per cent and clinical signs of schistosomiasis in fifty-two per cent.

Measures recommended were:—

- (1) Establishment of a Native Administration dispensary.
- (2) Appointment and training of a Sanitary Inspector.
- (3) Provision of adequate public latrines and properly protected wells.
- (4) Reclamation or drainage of pools and marshy ground.

In Lagos the ova of *S. hæmatobium* were demonstrated in 173 out of 3,285 specimens of urine examined in the pathological laboratories, and ova of *S. masoni* were found in fourteen specimens of stools.



## II.—GENERAL MEASURES OF SANITATION.

(a) *Sewage Disposal*.—Except in Lagos not much advance has been made during the year, but existing standards have at any rate been maintained. At the barracks of the R.W.A.F.F. at Enugu three large trough water closets with adjacent septic tanks were constructed to serve a camp population of about 1,000 persons. A water carriage system has also been installed at the European and African hospitals at Kaduna and in a few private houses at Kano.

In Lagos great progress has been made with the scheme for a water-carriage system introduced by the Director of Public Works in 1932. Sixteen public lavatories of the tank type are now in operation. The total discharge from them is 150,000 gallons a day, or one-sixth of the total amount of sewage which the Consulting Engineers estimated would be derived from Lagos Island, including Ikoyi. This is disposed of without recourse to sewers and pumping stations. A comparison of cost as between the old pail system and the present one shows that in addition to their decided sanitary advantages a considerable saving has been effected by the water carriage tank lavatories. Seven non-tank lavatories are in course of construction and it is expected that they will be ready for use in April, 1935. Good progress has been made with sewers and pumping stations and it is anticipated that they will be ready in time to deal with the new non-tank lavatories and with installations for the Prisons, King's College and Posts and Telegraphs buildings, which are to be connected to the system. A number of house connections have also been made. The tipping dump and disintegrator beneath the new Carter Bridge continue to work satisfactorily. The Director of Public Works estimates that the ultimate total of sewage to be disposed of by the methods proposed will be about 550,000 gallons a day. He states that the flow of water through the Carter Bridge (under which the main outfall discharges) has been estimated at 14,000 to 16,000 million gallons on each ebb tide and the fresh water discharge at 1,200 million gallons; and that nothing has so far been observed to controvert the view that dilution and dispersion of the sewage flow will be effective. Consideration is being given to the possibility of extending the scheme to Ebute Metta West.

The Medical Officer of Health, Lagos, has used a hand-operated auger for making 'bored hole' latrines with holes of fourteen-inch diameter. He finds that given a soil which is reasonably firm but not too hard, and where the sub-soil water level is fifteen to twenty feet below the surface, this fourteen-inch auger is very useful in the construction of cheap, sanitary village latrines, private or public. A cylinder of basket work easily made by local labour from local materials is used as a revetment and a concrete slab with suitable aperture and cover and a simple superstructure complete the latrine.

(b) *Scavenging and Refuse Disposal*.—A number of incinerators have been erected in rural districts with the aid of a grant from the Colonial Development Fund, but in most places mud incinerators of simple beehive design are employed and work quite satisfactorily.

Reclamation by the controlled tipping of refuse has been carried out to some extent on the outskirts of Lagos and at Onitsha and other places. Where supervision is adequate it causes little nuisance.

(c) *Drainage*.—Progress has been slow. The township of Aba has adopted a scheme for surface drainage, which will be carried out sectionally as funds permit. Drainage improvements are also in progress at Port Harcourt. The construction of new surface drainage in Lagos and Ebute Metta is going on gradually but steadily.

(d) *Water Supplies*.—The Director of Public Works has kindly furnished the following information about water supplies.



*Jos.*—This scheme, estimated to cost £28,000, is for a supply of 150,000 gallons per day to the town of Jos with its estimated population of 10,000. The supply will be taken from the Kogin Giri stream.

*Port Harcourt.*—A scheme involving the sinking of bored deep tube wells is under consideration.

Reports for supplies to Zaria, Kumba, Iperu, Oyo and Ogbomosho, have been prepared or are in course of preparation.

*Lagos.*—The average consumption during the past eight years was as follows :—

1927	...	...	1,764,000	gallons.
1928	...	...	1,835,000	„
1929	...	...	1,892,000	„
1930	...	...	2,073,600	„
1931	...	...	2,215,900	„
1932	...	...	2,449,700	„
1933	...	...	2,387,178	„
1934	...	...	2,563,260	„

which gives a total increase during the eight years of 799,260 gallons or practically 100,000 per year.

The water delivered during the year maintained the high standard of purity of previous years. Hydrated lime has taken the place of soda ash in the chemical treatment of the water with satisfactory results, including a reduction in the cost of chemical treatment.

(e) *Sanitary Inspections.*—In the Southern Provinces the Assistant Director of Health Service carried out inspections in the Oyo, Ijebu and Abeokuta Provinces, and the Senior Health Officer stationed at Enugu visited all the other provinces with the exception of the Cameroons Province. Routine sanitary inspections have been made regularly in all townships.

In the Northern Provinces the Senior Health Officer at Kaduna inspected all the more important places and as many of the smaller ones as possible at least once in the year. In the Mohammedan areas of the North the women inspectors are doing work of increasing usefulness.

### III.—SCHOOL HYGIENE.

School medical inspection in Lagos was interrupted to some extent by the absence on leave of the Lady Medical Officer-in-charge. The school clinic was open daily for the treatment of minor ailments and injuries. 2,680 new cases were registered with a total attendance of 19,652. A special clinic was held for eye cases. Routine inspection was carried on during the year and 931 children were examined.

Systematic medical inspection of school children in the Oyo and Abeokuta Provinces was curtailed owing to the fact that the Medical Officers of Health of these provinces were busily engaged for a considerable part of the year in dealing with extensive epidemics of smallpox.

A Medical Officer of Health has been conducting a survey of the school children in the Calabar Province with special reference to diet and deficiency disease. He examined 1,000 children, mostly day pupils living with parents or guardians. Of these he found that thirty-eight (3.8%) were suffering from definite symptoms including impairment of vision, while a further 119 (11.9%) gave a recent history of sore tongue and pruritus. The general clinical impression of these 1,000 children was that malnutrition to any marked extent was not common.

At Port Harcourt 320 children were medically inspected during the year. There was found to be a definite improvement in development and bodily cleanliness as compared with a corresponding examination in 1933.



In the Northern Provinces school buildings are inspected in the ordinary routine. The medical inspection of children in the middle schools continues with good results. The principal diseases are helminthic and in the case of elementary schools scabies and other skin conditions are common. The advantage of boarding schools is shown by the relatively good state of health and cleanliness of the middle school boys.

#### IV.—LABOUR CONDITIONS.

There is no contract or indentured labour in Nigeria. The plantations in the Cameroons Province are subject to the Labour Ordinance and nearly all of them have been scheduled as Health Areas. A Sanitary Superintendent was posted to this district to make detailed recommendations with regard to the sanitation of the camps and to assist the managers to carry them out. In this way it is hoped that labour camps well laid out, suitably drained and provided with efficient means of refuse and nightsoil disposal will soon be universal throughout this area. Progress would have been more rapid had it not been for the long period of economic depression.

In the Northern Provinces unemployment in the mining areas has been brought to an end by the increase in the tin quota and the activity in the gold mining areas. There has in fact been a shortage of labour in some localities.

Three Sanitary Superintendents are employed wholly or partially on the inspection of mining camps, and with the co-operation of the owners or managers they have effected considerable improvements especially in the tin areas of the Bauchi Plateau.

#### V.—HOUSING AND TOWN PLANNING.

In the Northern Provinces a new area has been laid out in Kano City but has not yet been occupied. Town planning schemes at Argungu and Birnin-Kebbi await execution.

At Katsina efforts have been made to reduce the large number of unoccupied and derelict houses, which are a feature of the larger Hausa towns.

New layouts at Kafanchan and Bida are occupied and progressing slowly.

Sokoto and Gusau towns have been improved by the widening of main streets.

In the Southern Provinces the provisions of the Public Health and Townships Ordinances relating to dwellings have been enforced, and elsewhere in towns and villages to which these ordinances do not apply the responsible authorities have in many cases put into force simple building regulations. Trade depression has naturally led to a reduction in the number of new buildings erected, but on the whole new dwellings are of an improving type.

In Port Harcourt a site previously occupied by labour lines of a most insanitary character has been cleared, all plots have been taken up and houses are in course of erection. The position is central with good roads, water supply, and electric light available. Permanent surface drainage is being laid down.

A town planning scheme worthy of note is being carried out at Ilaro, where a site for a new town including a large market is being cleared near the railway station. The land is the property of one family and leases will only be granted on conditions prescribed by the health authorities. Plots seventy-five feet by seventy-five feet in groups of twelve with roads fifty feet wide between are being demarcated and local rules as to percentage of building area and type of house are being formulated.



The Chairman of the Lagos Executive Development Board has kindly furnished the following information about town planning and slum clearance.

During the year a considerable advance has been made in the work of slum clearance in Lagos. Insanitary areas have been divided into five sections, the total area of which amounts to 33.4 acres. Precedence in dealing with these areas, some of which are even more insanitary than others, is necessarily determined by engineering factors—notably with regard to levels for drainage.

The slum clearance of the section known as scheme 7 has now been completed. The whole area of seven and half acres has been filled to efficient drainage levels; drains and roads have been constructed and the area has been replanned to provide plots for new buildings. The new layout of this area provides 111 plots of which seventy-four have already been either sold, leased, reserved for lease or exchanged. The development of this section is proceeding with remarkable rapidity.

The slum clearance of section No. 6 at Isalegangan was approved by the Governor on the 6th December, 1933—and immediate steps were taken to prepare a comprehensive scheme for dealing with the area. This section consists of 9.3 acres of low lying land which is extensively flooded in the rains, but the slum conditions are not quite so bad as they were in the areas covered by schemes 2 and 7 because there is more open space.

The average density of the population in this section according to the 1931 Census was 211 to the acre or about 1,580 for the area covered by the scheme, and at eight persons to the house in the area as replanned there would be a reduction in population of about forty-four per cent.

During the year, in section 7, 7,900 square yards of roads, 1,570 linear yards of concrete drains and two concrete culverts have been constructed. In addition, there has been a considerable amount of filling in places where the recently reclaimed land had settled.

Despite the depression in trade the development of the Yaba garden suburb has proceeded steadily; ninety-three houses have been completed during the year and forty are in course of construction, while 122 building plans have been approved. Of the houses built or building during the year fourteen have been financed under the African Staff Housing Scheme, and of the total of 384 houses built on the Yaba Estate, approximately twenty-five per cent have been erected under this scheme. A sign of the hard times is the tendency to build in mud and plaster instead of concrete or brick even on the more valuable plots on the main avenues, but it must be admitted that some attractive houses have been built in these materials which at first sight are indistinguishable from the more permanent houses. They will, however, deteriorate more rapidly and may consequently detract in time from the value of adjacent properties. More lodging houses also are beginning to appear, some built as a speculation by absentee landlords, and much vigilance has to be exercised by Building and Sanitary Inspectors lest the very slum conditions which the Yaba Estate was designed to alleviate in Lagos should arise here also. The popularity, however, of this suburb is assured and very cheap bus services have solved the transport difficulty. Altogether 698 plots have been taken up and it is estimated that the population has increased from about 2,200 to 2,800 during the year.

The engineering works at Yaba comprise the construction of 3,050 linear yards of concrete drains and 700 linear yards of water mains and the clearing and stumping of twenty-two acres of unleased plots. The Board also shared with the Town Council the cost of reconstructing the old Yaba Road, since, though the road actually lies



outside the estate, it serves a large number of houses on the estate. The canal has been dredged when necessary and the usual scavenging and conservancy services have been maintained.

## VI.—FOOD IN RELATION TO HEALTH AND DISEASE.

Food has been plentiful and cheap throughout the country. It is to be regretted that in too many cases the markets in which it is sold are primitive and insanitary. Efforts are being made to remedy this and with the aid of grants from the Colonial Development Fund model market stalls have been erected in a number of native administration areas. In the Northern Provinces there are excellent township markets at Jos and Kaduna and Zaria has embarked on a market improvement scheme.

In the Southern Provinces there have been improvements at Aba and Okigwi.

In Lagos progress is slow and the sale of foodstuffs still goes on in the streets under extremely unhygienic conditions. A number of open spaces have been declared as markets and as these become established improvement schemes will be possible. The local market women have a strong objection to anything in the nature of elaborate market stalls. One of the difficulties in regulating street trading is the enormous number of petty traders in proportion to the population.

Bakehouses generally throughout the country receive adequate supervision and the worst types are gradually being eliminated. Difficulty has, however, been experienced in attempting to secure the medical examination of persons employed in bread-making, and this is likely to continue until the licensing of individual bakers is instituted.

A modern abattoir, with cattle train siding and combined lairages and cattle market in the vicinity, is nearing completion at Apapa and will replace the antiquated and most unsatisfactory structures now in use.

Tuberculosis in cattle is by no means rare, especially in the townships east of the Niger, and it would appear to be increasing. At Calabar, out of 345 cattle slaughtered tuberculosis was reported to be present in twenty-nine cases, of which five were generalised, and also in some of the local pigs. In Lagos six cases in cattle were notified during the year.

A meeting of the Southern Provinces Dietetics Committee was held at Enugu early in the year, and as a result of this the Education Department has collected data on the height, weight, age and physical condition of pupils in a large number of schools in the Southern Provinces, which will be analysed by the Medical Officer of Health in charge of Dietetics Research. A copy of an approved dietary was issued to the managers of all schools, and it was recommended that pupils who supply their own food, as commonly happens, should be grouped into messes and follow the scale laid down as closely as possible. The question of school gardens and orchards was also stressed.

An examination of the school population of Katsina for nutrition and physique was carried out jointly by the Medical Officer of Health in charge of Dietetics Research and the Medical Officer. It was noted that the Pelidisi and A.C.H. indices corresponded closely with personal judgments. The results indicated that approximately fifty per cent of the pupils attending the schools at Katsina were below normal in nutrition and physique. It was noted that there was some improvement in the middle school in those who had been resident for more than one year.



An examination of children of certain of the pagan tribes of the Bauchi Plateau not attending school indicated that seventy to eighty per cent were of normal nutrition and physique.

The difference between the results here and at Katsina was attributed to diet and it was pointed out that the pagans are less scrupulous as to their source of protein and take large quantities of green food and a good deal of beniseed, which contains a useful protein and is a valuable source of mineral salts.

It was found during the year that the health of the inmates of the Boys' Industrial Home, Yaba, which is run by the Salvation Army as a Government reformatory, was far from good. A considerable number of the boys showed signs (in lips, tongue, eyes, and scrotum) indicative of some error or deficiency in diet. A properly balanced diet was worked out by the Assistant Medical Officer of Health, Lagos, who has made a special study of local foodstuffs, and since the adoption of this all the signs suggestive of food deficiency have disappeared.

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## B.—MEASURES TAKEN TO SPREAD THE KNOWLEDGE OF HYGIENE AND SANITATION.

The preparation of local cinema films on health subjects has been actively continued and excellent films are now available to illustrate anti-malarial work, plague and rat prevention and destruction, bug disinfection, infant welfare, Lagos health week, town development and re-planning, as well as the humane slaughtering of animals for meat.

Every effort is made to impress on the health staff that their work is mainly educational and should aim at development a sanitary conscience amongst the general public.

Arrangements are being made to give short vacation courses in sanitation of two or three weeks' duration to teachers from Mission Schools in the Asaba area, and it is hoped that these will be extended to teachers from other outlying districts. These courses are to be conducted at the Umuahia training centre for Native Administration Sanitary Inspectors.

A successful health week was held at Port Harcourt in March, and in December a very popular baby competition took place at Ijebu Ode.

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## C.—TRAINING OF SANITARY PERSONNEL.

In the Southern Provinces, in addition to the school for Government Sanitary Inspectors in Lagos, training centres for Native Administration Sanitary Inspectors are now established at Ibadan and at Umuahia in the Owerri Province. Systematic instruction at Ibadan was considerably interrupted by a serious epidemic of smallpox during which the pupils were employed on vaccination duty, the experience of which must have been of value to them. The erection of a workshop was completed during the year and is proving a very useful addition both for instructional purposes and as a source of models for the museum.

Twenty-five students in all have been under instruction since the centre started early in 1933, and it is anticipated that eight of these will pass out in April, 1935. The Umuahia centre is established at the Government College. The organisation and equipment are not



yet complete, but a Medical Officer of Health and an African Sanitary Inspector possessing the certificate of the Royal Sanitary Institute are on the spot, and three pupils commenced their training in September. It is hoped that necessary alterations and additions to buildings will be completed early in 1935 and that training will then be in full swing.

It will follow the lines of the Ibadan centre and will be essentially practical including a good deal of manual training. The number of students is likely to be small at first owing to economic depression, but when better times come this new centre should prove very valuable in training a health staff for the densely populated south-eastern provinces.

The new school building of the Kano training centre, which is for both Government and Native Administration Sanitary Inspectors, was opened early in the year. It was erected by means of a grant from the Colonial Development Fund. There is a hostel for Native Administration students about a quarter of a mile away within the city walls. The class is divided into a senior and a junior section and each section receives one lecture a day. There is also a practical class. In this class scale drawing and arithmetic are taught. The pupils first draw models of approved sanitary structures and subsequently model them in plasticene. They also construct life size models in the school compound. The construction of permanent models for the school museum has gone steadily forward.

Nine students who had completed the course were posted to out-stations in March. At the end of the year there were sixteen students in training, eleven in the senior and five in the junior class.

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#### D.—RECOMMENDATIONS FOR FUTURE WORK.

(1) Additional pipe-borne water supplies for important towns, especially Ibadan.

(2) Extension of water carriage system of nightsoil disposal for public latrines in townships and for Government institutions.

(3) Improvement schemes for markets in townships and important towns.

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### IV.—PORT HEALTH WORK AND ADMINISTRATION.

In the first nine months of the year owing to trade depression the number of ships entering the port of Lagos was far below normal, but during the last three months with better prices and good crops of groundnuts and cocoa there was a great increase in the amount of shipping and in deck passenger traffic. Medical examination of incoming and outgoing passengers, vaccination, disinfection and disinfestation have been continued as a routine measure throughout the year. Increasing use has been made by seamen of the early treatment facilities provided by the clinic for venereal diseases at Apapa.

All vessels not in possession of a valid deratisation or deratisation exemption certificate were subjected to a careful rodent survey.

Permanent harbour craft were each fumigated once during the year. In addition, all ocean going vessels on arrival and all permanent harbour craft are continuously trapped, the rats recovered both after fumigation and trapping being examined for plague. No plague infected rat was discovered throughout the year. With the exception of one case of chicken-pox no infectious disease was found on vessels.



As in former years the strictest precautions have been taken to prevent mosquito breeding on the foreshore and in harbour craft, 5,842 craft inspections were made, the larval index being 0.25.

At Port Harcourt 305 ships entered and 303 left the port. With the exception that no facilities exist for the deratisation of ocean going vessels the port health organisation is on similar lines to that of Lagos.

During the outbreak of smallpox passengers and crews of ships were vaccinated, and it was noted that the average British European crew was very badly protected against smallpox. The necessity for vaccination of the personnel of ships sailing to West Africa is obvious, and if crews were medically inspected prior to signing on such cases should not occur.

At Calabar facilities on shore for the medical inspection of passengers are very inadequate, but it is hoped in the near future to convert a vaccination bureau on the foreshore into an inspection and disinfection station.

9,282 passengers proceeding up the Cross River were medically inspected and vaccinated during the year. One infected coastal steamer from which a case of smallpox had been removed at Santa Isabel, Fernando Po, entered the port. Passengers and crew were subjected to the usual measures of observation, surveillance and disinfection.

One case of smallpox in a Krooboy on a vessel which called at Degema was detected and appropriately dealt with. Infection had apparently been contracted in Sierra Leone.

W. H. PEACOCK.

*Deputy Director of Health Service.*

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## **V.—MATERNITY AND CHILD WELFARE.**

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*Training of Midwives.*—During the year five certificates of proficiency were granted in the 1st grade and five in the 2nd grade. In order to obtain the 1st grade certificate pupil midwives are required to attend a recognised training centre for two and half years and, having passed the written and practical examination, they are then registered for practice anywhere in Nigeria. Training for the Grade II Certificate is given at Mission hospitals which are recognised by the Midwives Board. The period of training is for six months or more and the examination is oral and practical only; the girls are registered for practice in the local area where they are trained or born.

The maternity hospital at Massey Street, Lagos, continues to be popular. During the year 518 normal pregnancies, eighty-five cases of abnormal labour, and 133 ante-natal cases were admitted to the wards, and 1,880 women attended the ante-natal clinics. The child welfare centres held at Massey Street, Lagos, and at Ebute Metta are now firmly established institutions and 6,841 attendances at these clinics were recorded during the year. The African Health Visitors employed by the Lagos Town Council made 33,715 house visits and it is realised how valuable the work of these women has become now that

they have gained experience in their work. They are under the control of an European Nursing Sister and the Medical Officer of Health. The following table defines the scope of their work :—

	Lagos.	Ebute Metta.	Combined.
New cases reported born in Lagos ... ..	3,436	1,049	4,485
New cases reported born outside Lagos ...	87	2	89
Total new cases for the year ... ..	3,523	1,051	4,574
Number of babies alive at first visit ...	3,371	1,017	4,388
Number of babies dead at first visit ...	152	26	178
Number of mothers alive at first visit ...	3,513	1,042	4,555
Number of mothers dead at first visit ...	10	1	11
Number of cases not found at first visit ...	—	8	8
Total revisits ... ..	18,380	5,691	24,071
Number of babies alive at revisit ... ..	18,078	5,619	23,697
Number of babies dead at revisit ... ..	302	72	374
Number of mothers alive at revisit ... ..	18,375	5,689	24,064
Number of mothers dead at revisit ... ..	5	2	7
Cases attended by Medical Practitioners ...	875	111	986
Cases attended by Native Medicine men ...	2,647	932	3,580
Cases induced to attend dispensaries ...	238	19	257
Number of following up cases of sick children	534	173	707
Number of following up visits of sick children	4,368	551	4,919
Number of special cases for Lady Medical Officer ... ..	26	3	29
Number of special visits paid for Lady Medical Officer ... ..	110	17	127
Number of cases found by Health Visitors	130	5	135
Number of ante-natal cases found ... ..	2	—	2
Number of ante-natal visits paid ... ..	24	—	24

The new maternity hospital which has been built at Aba with a grant from the Colonial Development Fund was formally opened by the Resident of Owerri Province towards the end of the year and the maternity hospital which has been built from the same grant at Calabar has been completed and has been opened for out-patient and child welfare work; the in-patient ward will be opened upon completion of re-laying of water pipes in the township. At Aba interest in child welfare work is growing, and 1,289 new cases with 8,823 attendances were recorded. At Ijebu Ode maternity cases have steadily increased at the maternity ward within the general hospital :—

	1932.	1933.	1934.
Confinements ... ..	47	102	196
Infant Welfare Attendances	539	1,236	2,601

At this town a baby show was held in December and proved remarkably successful. The Infant Welfare Centres supported by the Egba Native Administration at Abeokuta under the charge of Miss McCotter record an astonishing number of attendances and there can be no doubt of their great popularity and usefulness. At Akure in Ondo Province a single building has been put up to accommodate the growing child welfare clinic which has proved most successful. At Victoria and Buea in the Cameroons child welfare clinics are held weekly by European ladies with the assistance of the Medical Officer and Nursing Sister. At Kumba in the Cameroons an opportunity was taken to examine 300 infants and young children and the Medical Officer writes :—

“ One instructive fact was revealed, namely the amount of  
 “ malnutrition in young children of the farming classes living  
 “ within a short distance of the hospital. Emaciation, late closing  
 “ of the fontanelles, delayed dentition, dental softening and  
 “ indeed all degrees of avitaminosis and marasmus could be  
 “ witnessed at one meeting.”



In May the travelling Lady Medical Officer, who has been seconded to Government by the Church Missionary Society for work in Owerri Province, commenced work, using Ebu near Owerri as her centre and travelling by car and lorry. At first all women and children were treated; later it was necessary to confine the work to pregnant women and to children only. The experiment proved an immense success, and within six months 9,210 patients had been seen, much useful ante-natal work had been carried out and nearly 3,000 injections for yaws and syphilis had been given.

In the Northern Provinces the maternity hospital built at Ilorin from a Colonial Development Fund Grant was opened in April. Forty-seven labours were conducted and there were 728 infant welfare attendances, which is a promising start in a Mohammedan and Pagan area. Much attention has been paid by the Nursing Sister to mothercraft lectures and demonstrations which have proved very popular.

The female section of the native administration hospital in Kano city was extended by building a new ward for thirty-four beds, bringing the accommodation to fifty-two beds and twelve cots. Ante-natal and maternity work is steadily increasing and is aided by house visits paid by the Nursing Sister upon reports made by the female sanitary labourers. At Katsina the female section of the hospital is now fully used by the people but the Hausa women will not go there for ante-natal advice or for delivery. They are however showing more desire to bring their children to hospital, and it is hoped that by means of house visiting by the Nursing Sister ante-natal and maternity work will gradually expand. A new female ward for use for maternity work has been built at the native administration hospital at Maiduguri and an European Nursing Sister was posted to this hospital but unfortunately she was invalided and no relief was available.

There can be no doubt that maternal mortality in child birth is exceedingly high in Nigeria and is due to ignorance, widespread use of native drugs and unskilful manipulation. From a station in the Southern Provinces a Medical Officer (Dr. T. Simpson) writes as follows :—

“ *Native Medicine.*—In all branches of hospital work frequent cases of native medicine poisoning are encountered and unfortunately is this especially so in the maternity branch. With the exception of a few of the more civilised the taking of native medicine by pregnant women is almost universal. Whatever may be said for native medicine as commonly used in this province, it most decidedly has no place in normal pregnancy and less so during labour. Towards the end of pregnancy native medicine is given in increasingly large doses and is responsible for the high abortion, miscarriage and still-birth rate. The large quantities of this medicine given during delayed labour, is a serious menace to delivery and is only too frequently the cause of death of both mother and child. The diagnosis of the unfortunate cases, when brought to hospital, is only too apparent, the helpless picture of these women arouses the greatest sympathy. The syndrome of events is precisely as follows, when a woman is about to begin labour, the native medicine man is called upon, he administers drugs the mild oxytoxic properties of which do help to bring on labour pains. If things were left at this stage all might be well but by giving more and more medicine the uterus becomes over stimulated, the pains decrease in severity and finally pass off. The uterus becomes tense and abdomen very tender. The pulse becomes rapid, thready and weak. There is a slight rise in temperature. This stage of events is reached about two days after labour first set in. The condition already serious is rendered



worse by the local application of native drugs and even efforts at manipulation by the more daring medicine men. Attempts are made at dilatation of the cervix by the forcible introduction of a cow's horn into the vagina. In cases brought to the hospital the cow's horn had failed to enter the cervix, the laceration thus caused is beyond description. When these measures had failed, in a corpse recently inspected, uterine section had been performed and a dead child removed, no attempt at hæmostasis had been made. In other cases attempts were made by hand to reach the child per vaginam, three such cases brought to our notice had resulted in transverse lies, within one case an arm pulled off. Our experience gained from the ante-natal clinic would point to the fact that albuminuria and toxæmias of pregnancy are much enhanced and in many cases brought on by these native drugs.

The treatment in hospital of patients in labour, in whom labour pains have passed off and in a very toxic condition, calls for very special care. It often takes days by the most strict administration of heart stimulants, the use of morphia and intravenous infusions to keep them alive. The question of artificial delivery in these cases is a variable one, while in some cases it is best to procure rapid delivery, in others it is best to wait for some degree of recovery of the mother and hope for a return of normal pains. With either method there is a high mortality.

With increased education and the passing of the older generation much improvement may be expected to follow. Increasing ante-natal care should do much to ameliorate the wholesale use of native drugs and thus save in this province alone hundreds of maternal lives."

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## VI.—HOSPITALS AND DISPENSARIES.

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### A.—HOSPITALS AND HOSPITAL STATISTICS.

Owing to the financial position little extension of hospital buildings has been possible except that in the Northern Provinces some native administrations have been able to release reserve funds for this purpose. Thus, with native administration funds, a new female ward is being built at Katsina; a laboratory and a medical store have been erected at Maiduguri and electric light has been put into the hospital; a hospital has been built at Hadejia and is nearly completed; an out-patient block and operating theatre have been completed at Gusau; at Idah an extension has been made to a dispensary to convert it into a small hospital; a new female ward has been built at Kano.

With the expansion of the city hospital at Kano it was decided partially to close the African hospital at Fagge outside the city and this is being maintained now as a dispensary with twenty beds only.

At Kaduna water sewage has been installed at both European and African hospitals and part of the European hospital has been utilised to form two new wards for convalescent patients. A new operating theatre has been built at Ikot Ekpene.

It is interesting to note the increasing demand for hospital accommodation for females, and the increasing proportion of women who are attending hospital. Thus at Aba women form forty-five per cent of the out-patients and thirty-seven per cent of the in-patients.

The following tables show the types of the hospitals which have been maintained and the facilities which exist :—



NIGERIA.

EUROPEAN HOSPITAL STATISTICS, 1934.

No.	Name of Hospital.	* C. G. or N. A.	No. of Beds.	No. of Cots.	Remaining end 1933.	IN-PATIENTS ADMISSIONS.			Remaining end 1934.	OUT-PATIENTS TREATED.			Total Patients treated.	NUMBER OF OPERATIONS.			NURSING STAFF.			
						Male.	Female.	Total.		Male.	Female.	Total.		Major.	Minor.	Total.	European Sisters.	AFRICAN.		
																		Male.	Female.	Total.
1	Calabar	C.G.	8	—	—	23	5	28	—	270	59	329	357	—	5	5	1	1	—	1
2	Enugu	C.G.	12	—	5	76	20	96	3	340	82	422	518	—	—	—	2	3	—	3
3	Ibadan	C.G.	14	—	2	84	10	94	1	285	70	355	449	1	14	15	1	5	1	6
4	Jos ...	C.G.	18	—	6	80	21	101	4	347	92	439	540	2	36	38	2	3	1	4
5	Kaduna	C.G.	16	—	8	112	36	148	3	223	76	299	447	3	29	32	2	7	1	8
6	Kano	C.G.	14	2	5	19	15	34	2	398	97	495	529	—	30	30	1	5	1	6
7	Lagos	C.G.	30	2	7	208	66	274	10	933	196	1,129	1,403	15	25	40	3	7	3	10
7a	Lagos, Ebute Metta European Dispensary	—	—	—	—	—	—	—	—	291	38	329	329	—	—	—	—	—	—	—
8	Lokoja	C.G.	4	—	—	8	—	8	—	54	16	70	78	—	—	—	1	—	—	—
9	Onitsha	C.G.	4	—	—	21	3	24	—	64	23	87	111	—	—	—	$\frac{1}{2}$	—	—	—
10	Port Harcourt ...	C.G.	13	2	4	69	23	92	2	341	90	431	523	—	—	—	2	3	1	4
11	Victoria	C.G.	4	—	2	6	5	11	—	66	26	92	103	—	—	—	$\frac{1}{2}$	6	2	8
12	Warri	C.G.	8	—	1	51	2	53	4	150	44	194	247	—	—	—	$\frac{1}{2}$	3	—	3

\* C.G. = Central Government.

N.A. = Native Administration.

## AFRICAN HOSPITAL STATISTICS, 1934

## NORTHERN PROVINCES.

No.	Type of Hospital.	Name of Hospital.	* C.G. or N.A.	No. of Beds.	No. of Cots.	Remaining end 1933.	IN-PATIENTS ADMISSIONS.			Remaining end 1934.	OUT-PATIENTS TREATED.			Total Patients treated.	OPERATIONS.			Nursing Sisters Average No.	AFRICAN NURSING STAFF.		
							Male.	Female.	Total.		Male.	Female.	Total.		Major.	Minor.	Total.		Male.	Female.	Total.
1	C	Azare ...	N.A.	31	—	185	1,121	281	1,402	169	1,941	470	2,411	3,813	43	109	152	—	2	—	2
2	C	Bauchi ...	C.G.	42	—	80	516	136	652	136	4,757	1,096	5,853	6,505	116	213	329	—	3	—	3
3	C	Bida ...	N.A.	50	—	21	441	67	508	53	2,039	395	2,434	2,942	48	130	178	—	2	—	2
—	D	Birnin Kebbi	N.A.	—	—	—	—	—	—	—	2,105	713	2,818	2,818	—	135	135	—	—	—	—
—	C	Gadau (Dispensary)	C.G.	5	—	11	56	14	70	5	1,810	847	2,657	2,727	19	19	38	—	1	—	1
4	D	Gusau ...	N.A.	17	—	22	344	51	395	—	2,064	527	2,591	2,986	16	86	102	—	2	—	2
5	—	Hadejia ...	N.A.	37	—	—	—	—	—	—	—	—	—	—	—	—	—	—	2	—	2
6	D	Idah ...	C.G.	—	—	1	78	6	84	—	1,652	1,003	2,655	2,739	7	4	11	—	1	—	1
7	B	Ilorin ...	N.A.	21	—	—	371	—	371	25	3,464	1,221	4,685	5,056	75	128	203	1	2	—	2
7	B	Ilorin Welfare	N.A.	10	8	—	—	184	184	9	—	2,236	2,236	2,420	6	5	11	1	—	1 $\frac{1}{2}$	1 $\frac{1}{2}$
8	B	Jos ...	C.G.	94	2	109	1,027	263	1,290	—	7,102	2,084	9,186	10,476	210	314	524	1	14	3	17
9	B	Kaduna ...	C.G.	83	2	61	1,228	192	1,420	63	8,553	1,615	10,168	11,588	195	616	811	1	14	2	16
10	D	Kafanchan	C.G.	36	—	51	407	153	560	32	3,635	2,047	5,682	6,242	55	205	260	—	3	—	3
11	B	Kano Fagge	C.G.	20	—	98	1,181	353	1,534	21	5,167	1,692	6,859	8,393	145	541	686	1	6	1	7
12	B	Kano City	N.A.	157	12	124	931	—	931	119	4,396	129	4,525	5,456	114	141	255	1	—	2	2
12	B	Kano Women's and Children	N.A.	—	—	55	—	596	596	62	—	1,923	1,923	2,519	53	47	100	—	—	—	—
13	B	Katsina, Men's	N.A.	122	2	87	1,206	—	1,206	76	6,945	—	6,945	8,151	91	361	455	1	1	1	2
13	B	Katsina, Women's	N.A.	—	—	—	—	486	486	—	—	1,464	1,464	1,950	31	83	114	—	—	1	1
14	D	Lafia ...	C.G.	19	—	13	134	37	171	—	2,681	1,528	4,209	4,380	10	43	53	—	2	—	2
15	B	Lokoja ...	C.G.	43	—	25	252	95	347	28	2,811	1,062	3,873	4,220	105	142	247	1	7	2	9
16	C	Maiduguri	N.A.	75	2	145	1,254	156	1,410	54	6,618	1,892	8,510	9,920	327	476	803	—	4	—	4
17	C	Makurdi	C.G.	81	—	—	662	130	792	66	3,948	1,279	5,227	6,019	184	118	302	—	8	—	8
18	C	Minna ...	N.A.	25	—	15	453	33	486	—	3,317	565	3,882	4,368	67	85	152	—	5	—	5
19	C	Pankshin	C.G.	42	—	56	559	139	698	54	2,802	1,257	4,059	4,757	185	180	365	—	—	—	—
20	C	Sokoto ...	N.A.	81	6	93	1,004	295	1,299	46	4,716	687	5,403	6,702	126	175	301	—	3	—	3
21	D	Wukari ...	N.A.	46	—	24	221	106	327	—	3,604	1,600	5,204	5,531	100	370	470	—	3	—	3
22	D	Yola ...	C.G.	44	—	41	771	43	814	—	4,684	856	5,540	6,354	19	84	103	—	2	—	2
23	B	Zaria ...	C.G.	110	3	2	132	1	133	—	5,912	1,106	7,018	7,151	96	545	641	1	7	1	8

In column four "C.G." and "N.A." mean hospitals built and equipped by the Central Government or Native Administration respectively.  
*Types of Hospital* :—B. Modern Hospitals to which European Nursing Sisters are posted for duty and where the training of junior African Nurses is carried out.  
 C. Modern Hospitals to which no European Nursing Sister is posted.  
 D. "Bush" Hospitals.



No.	Type of Hospital.	Name of Hospital.	C.G. or N.A.	No. of Beds.	No. of Cots.	Remaining end 1933.	IN-PATIENTS ADMISSIONS.			Remaining end 1934.	OUT-PATIENTS TREATED.			Total Patients treated.	OPERATIONS.			Nursing Sisters Average No. in 1934.	AFRICAN NURSING STAFF.		
							Male.	Female.	Total.		Male.	Female.	Total.		Major.	Minor.	Total.		Male.	Female.	Total.
1	B	Aba	C.G.	98	10	31	748	468	1,216	79	13,309	10,799	24,108	25,324	172	357	529	6	3	9	1
2	C	Abakaliki	C.G.	16	—	14	165	27	192	7	4,053	1,644	5,697	5,889	14	18	32	2	—	2	—
3	B	Abeokuta	C.G.	100	2	28	528	263	791	61	4,908	1,630	6,538	7,329	422	216	638	6	1	7	1
4	D	Afikpo	C.G.	4	—	—	—	—	—	—	4,064	1,191	5,255	5,255	—	—	—	—	—	—	—
5	C	Agbor	C.G.	26	—	38	314	153	467	22	5,639	4,261	9,900	10,367	64	219	283	5	—	5	—
6	C	Akure	C.G.	42	—	20	277	108	385	—	2,714	1,746	4,460	4,845	77	166	243	3	1	4	—
7	C	Bamenda	N.A.	53	—	50	763	316	1,079	75	6,167	2,424	8,591	9,670	202	186	388	5	—	5	—
8	D	Banso	N.A.	30	—	5	375	237	612	23	3,999	2,822	6,821	7,433	48	296	344	2	—	2	—
9	C	Benin City	C.G.	25	—	10	198	55	253	26	13,182	5,182	18,364	18,617	48	229	277	—	—	—	—
10	C	Buea	C.G.	24	—	—	34	2	36	—	2,753	1,007	3,760	3,796	—	—	—	2	—	2	—
11	B	Calabar	C.G.	106	10	69	1,051	446	1,497	80	15,418	5,919	21,337	22,834	172	625	797	12	7	19	2
12	C	Degema	C.G.	25	—	14	279	143	422	11	5,314	2,815	8,129	8,551	72	142	214	3	—	3	—
13	B	Enugu	C.G.	48	7	62	1,823	227	2,050	60	16,140	4,360	20,500	22,550	123	511	634	15	2	17	1
14	C	Forcados	C.G.	12	—	11	183	24	207	—	6,387	1,675	8,062	8,269	31	256	287	2	—	2	—
15	B	Ibadan, Adeoyo	N.A.	78	3	42	627	262	889	34	7,433	5,588	13,021	13,910	323	350	673	—	1	7	1
16	C	Ibadan, African	C.G.	34	—	41	519	89	608	19	5,721	908	6,629	7,237	56	281	337	7	1	8	1
17	C	Ijebu-Ode	C.G.	67	13	—	766	527	1,293	—	4,795	2,165	6,960	8,253	248	204	452	7	1	8	1
18	D	Ikot-Ekpene	—	—	—	—	—	—	—	—	3,852	1,224	5,076	5,076	1	41	42	—	—	—	—
19	C	Kumba	N.A.	74	—	58	588	183	771	55	9,827	5,707	15,534	16,305	90	243	333	—	—	—	—
20	B	Lagos, African	C.G.	59	—	36	641	153	794	49	3,428	1,662	5,090	5,884	228	138	366	3	—	3	—
21	B	Lagos, Massey Street	C.G.	186	16	165	2,458	541	2,999	144	18,749	11,307	30,056	33,055	929	616	1,545	28	6	34	4
21a	C	Lagos, I.D.H. (Yaba)	C.G.	18	25	14	85	948	1,033	13	1,936	6,132	8,068	9,101	79	75	154	—	—	—	1
21a	C	Lagos, Prisons	C.G.	112	—	4	195	82	277	1	—	—	—	277	—	—	—	1	—	—	—
21a	C	Lagos, Yaba Asylum	C.G.	—	—	7	139	—	139	3	2,391	27	2,418	2,557	—	—	—	1	—	—	—
21a	C	Lagos, Ebute Metta	C.G.	3	—	169	28	6	34	181	853	375	1,228	1,262	—	13	13	14	9	23	—
22	C	African Dispensary	—	—	—	—	—	—	—	—	18,451	3,469	21,920	21,920	—	—	—	2	—	—	—
23	C	Mamfe	C.G.	43	—	—	698	261	959	—	7,011	3,235	10,246	11,205	409	179	588	3	—	3	—
24	C	Obubra	C.G.	16	—	1	278	51	329	22	4,539	2,628	7,167	7,496	137	82	219	1	—	1	—
25	C	Ogoja	N.A.	18	—	10	165	28	193	3	2,914	1,337	4,251	4,444	10	51	61	2	—	2	—
25	C	Okigwi	N.A.& C.G.	85	10	71	988	383	1,371	59	12,320	4,213	16,533	17,904	549	342	891	5	—	5	—
26	B	Onitsha	C.G.	56	1	131	575	143	718	149	10,458	5,979	16,437	17,155	25	334	359	9	4	13	—
27	D	Opobo	C.G.	30	—	17	233	38	271	5	53,114	40,162	93,276	93,547	28	39	67	2	—	2	—
28	C	Oshogbo	C.G.	35	—	18	206	79	285	7	2,202	840	3,042	3,327	16	77	93	3	2	5	—
29	C	Owerri	C.G.& N.A.	76	—	—	597	264	861	—	7,888	3,675	11,563	12,424	216	247	463	4	—	4	—
30	B	Port Harcourt	N.A.	126	30	109	1,405	479	1,884	90	17,086	5,075	22,161	24,045	532	946	1,478	16	2	18	1
31	C	Sapele	N.A.	24	—	11	270	53	323	14	4,146	1,301	5,447	5,770	35	43	78	4	—	4	—
32	C	Umuahia	C.G.	16	—	—	261	38	299	—	8,257	5,386	13,643	13,942	197	484	681	3	—	3	—
33	B	Victoria	C.G.	79	2	58	633	208	841	73	5,126	2,269	7,395	8,236	148	266	414	6	2	8	—
33	B	Warri	C.G.	30	2	11	374	102	476	15	5,248	1,603	6,851	7,327	136	39	175	3	2	5	—



## B.—NATIVE ADMINISTRATION DISPENSARY SYSTEM.

There are now 231 dispensaries open, ninety-six situated in the Northern Provinces and 135 in the Southern Provinces. These dispensaries undoubtedly serve a useful purpose, acting as feeders to base hospitals, and treating minor complaints. The motor ambulances which were obtained under a grant made by the Colonial Development Fund have increased the usefulness of the dispensaries. In time it is hoped that they will become real health centres, rather than purely treatment centres, and this purpose is to some extent being introduced by encouraging infant vaccination at the dispensaries. Unfortunately the medical supervision of the dispensaries has become more difficult owing to shortage of medical staff, but some improvement will occur when the existing staff of medical officers becomes more mobile which will occur when medical assistants, trained at Yaba, are posted to the base hospitals as house surgeons.

The following table shows the numbers of dispensaries in operation in the various provinces:—

*Northern Provinces.*—Adamawa, 8; Bauchi, 8; Benue, 12; Bornu, 9; Ilorin, 6; Kabba, 8; Kano, 8; Katsina, 6; Niger, 9; Plateau, 9; Sokoto, 11; Zaria, 2. Total 96.

*Southern Provinces.*—Abeokuta, 9; Benin, 20; Calabar, 18; Cameroons, 7; Colony, 4; Ijebu, 8; Ogoja, 11; Onitsha, 9; Owerri, 21; Oyo, 20; Warri, 8. Total 135.

The following table indicates the main diseases treated at the dispensaries during 1934:—

Disease.					Northern Provinces.	Southern Provinces.	Total.
1.	Relapsing fever ...	...	...	...	118	322	440
2.	Malaria ...	...	...	...	7,727	37,371	45,098
3.	Smallpox ...	...	...	...	188	61	249
4.	Chickenpox ...	...	...	...	434	531	965
5.	Influenza ...	...	...	...	196	322	518
6.	Trypanosomiasis ...	...	...	...	646	172	818
7.	Cerebro-spinal meningitis ...	...	...	...	147	87	234
8.	Dysentery ...	...	...	...	2,115	4,172	6,287
9.	Leprosy ...	...	...	...	891	930	1,821
10.	Yaws ...	...	...	...	1,024	21,256	22,280
11.	Syphilis ...	...	...	...	19,416	4,268	23,684
12.	Conjunctivitis ...	...	...	...	4,133	2,845	6,978
13.	Other eye diseases ...	...	...	...	4,599	4,367	8,966
14.	Otitis media ...	...	...	...	2,210	4,956	7,166
15.	Other diseases of ear ...	...	...	...	1,246	4,220	5,466
16.	Cough ...	...	...	...	11,173	10,813	21,986
17.	Pneumonia ...	...	...	...	1,118	962	2,080
18.	Tuberculosis of lungs ...	...	...	...	319	329	648
19.	Diseases of teeth and gums ...	...	...	...	3,013	5,963	8,976
20.	Dyspepsia ...	...	...	...	4,816	13,039	17,855
21.	Diarrhœa (infants) ...	...	...	...	1,391	4,148	5,539
	Diarrhœa (adults) ...	...	...	...	1,391	3,795	5,186
22.	Constipation ...	...	...	...	18,946	46,149	65,095
23.	Hæmorrhoids ...	...	...	...	372	851	1,223
24.	Jaundice ...	...	...	...	906	1,346	2,252
25.	Dropsy, ascites ...	...	...	...	225	1,545	1,770
26.	Hernia, inguinal ...	...	...	...	242	333	575
	Hernia, umbilical ...	...	...	...	278	95	373
27.	Tænia ...	...	...	...	11,757	3,476	15,233
28.	Ascaris ...	...	...	...	1,046	27,874	28,920
29.	Guinea worm ...	...	...	...	3,480	2,557	6,037
30.	Arthritis ...	...	...	...	3,472	3,938	7,410
31.	Chronic rheumatism ...	...	...	...	15,858	39,372	55,230
32.	Gonorrhœa ...	...	...	...	7,564	9,153	16,717
33.	Orchitis and epididymitis ...	...	...	...	261	283	544
34.	Hydrocele ...	...	...	...	158	66	224
35.	Leucorrhœa ....	...	...	...	23	482	505



Disease.						Northern Provinces.	Southern Provinces.	Total.
36.	Abortion	...	...	...	...	16	145	161
37.	Boil	...	...	...	...	3,963	3,958	7,921
38.	Abscess	...	...	...	...	4,971	4,988	9,959
39.	Ulcer	...	...	...	...	24,586	54,120	78,706
40.	Scabies, craw-craw	...	...	...	...	16,217	32,379	48,596
41.	Other skin diseases	...	...	...	...	5,896	11,631	17,527
42.	Lymphademitis, bubo	...	...	...	...	898	1,882	2,780
43.	Elephantiasis	...	...	...	...	167	188	355
44.	Chigoes	...	...	...	...	849	626	1,475
45.	Snake-bite	...	...	...	...	117	293	410
46.	Scorpion sting	...	...	...	...	404	128	532
47.	Burns	...	...	...	...	1,725	2,333	4,058
48.	Wounds and injuries	...	...	...	...	13,338	26,465	39,803
49.	Fractures	...	...	...	...	139	706	845
50.	Tumours	...	...	...	...	168	1,490	1,658
51.	Paralysis	...	...	...	...	46	216	262
52.	Mania	...	...	...	...	36	27	63
53.	Poisoning, native medicines	...	...	...	...	11	42	53
	Poisoning juju obsessions	...	...	...	...	26	19	45
54.	Fits, epilepsy	...	...	...	...	68	286	354
55.	Tetanus	...	...	...	...	36	18	54
56.	Schistosomiasis	...	...	...	...	371	4	375
57.	Sore throat	...	...	...	...	1,110	41	1,151
58.	Ankylostomiasis	...	...	...	...	1,467	—	1,467
59.	Pleurodynia	...	...	...	...	896	—	896
60.	Lumbago	...	...	...	...	5,733	—	5,733
61.	Headache	...	...	...	...	4,556	38	4,594
62.	Debility	...	...	...	...	3	24	27
63.	Mumps	...	...	...	...	4	—	4
64.	Vaccinations	...	...	...	...	815	—	815
65.	Circumcisions	...	...	...	...	30	—	30
66.	Other diseases	...	...	...	...	79	1,929	2,008
Total						181,640	446,425	628,065

### C.—MEDICAL WORK OF RELIGIOUS MISSIONS.

The following table has been compiled from information kindly supplied by mission Superintendents :—

Mission.	No. of Stations performing Medical work.	No. of Doctors.	No. holding Missionary Permits.	NATURE OF WORK.				Cases Treated.	Total Attendances.
				Hospitals.	Dispen- saries.	Leprosy.	Maternity and Infant Welfare.		
NORTHERN PROVINCES.									
Sudan Interior Mission ...	31	1	55	1	31	2	8	18,131	175,520
Sudan United Mission ...	23	2	55	1	20	2	5	20,795	178,438
Dutch Reformed Church Mission ... ..	6	2	10	1	4	1	1	10,754	176,732
Christian Mission in Many Lands ... ..	3	...	4	...	4	1	...	20,330	4,240
Church of the Brethren Mission	3	2	3	2	3	1	1	5,463	51,650
SOUTHERN PROVINCES.									
American Baptist Mission, Ogbomosho ... ..	3	2	1	1	2	2	1	2,859	26,088
Methodist Missionary Society	54	3	3	1	3	1	3	6,555	36,239
Church of Scotland ... ..	4	3	4	2	4	2	1	11,054	68,792
Qua Iboe Mission ... ..	10	1	13	5	10	1	5	22,000	32,000
Basel Mission ... ..	10	...	16	...	10	...	4	5,650	22,400
Church Missionary Society ...	3	4	5	1	8	...	3	35,385	70,104
Amachara Medical Mission ...	...	...	1	1	1	...	35	4,524	11,411
Primitive Methodist Mission, Port Harcourt ... ..	9	1	...	4	5	...	4	19,182	25,918
Wesley Guild Hospital, Ilesha	2	2	...	1	1	1	1	4,107	22,751

## D.—DENTAL SERVICES REPORT.

Of the two Dental Surgeons one, Mr. C. N. Pearson, was on leave from 31st March until 29th November, 1934. During the first three months of the year he was stationed in Lagos but was incapacitated by ill health for part of the time and required an extension of leave to render him fit to return. Mr. C. D. Cunningham was stationed at Kaduna for the first three months of the year and visited Kano and Jos during the period. He came to Lagos at the end of March and remained there until Mr. Pearson relieved him at the end of November when he returned to Kaduna.

2. The following figures indicate the amount and nature of the dental work done during the year for European officials and for African officials and their wives and children:—

Fillings, 801; dressings, 234; extractions, 523; scalings, 227; root treatments, 56; repairs to dentures, 30; partial dentures, 17; full dentures, 10; attendance for treatment, 1,404.

## E.—SURGICAL OPERATIONS. 1934.

Nature of Operation.	Total.	Cured.	Relieved.	Unrelieved.	Died.
<b>A. GENERAL.</b>					
Amputations ... ..	220	196	10	...	14
Appendectomy ... ..	54	47	1	...	6
Bubonocoele (radical cure) ...	48	47	1	...	...
Fractures, plating, etc. ...	165	155	5	...	5
Herniotomy ... ..	1,908	1,854	16	2	36
Hepatic abscess (drainage, etc.)	9	6	...	1	2
Laparotomy ... ..	91	40	12	11	28
Perforated gastric ulcer (suture)	5	5	...	...	...
Perforated duodenal ulcer (suture)	1	1	...	...	...
Hæmorrhoids (radical cure) ...	87	85	2	...	...
Colotomy ... ..	6	2	...	1	3
Excision, benign tumours and cysts	451	447	2	1	1
Excision (malignant tumours)	109	84	19	4	2
Excision glands ... ..	165	153	8	4	...
Excision breast ... ..	19	17	2	...	...
Enterectomy ... ..	49	37	7	...	5
Sequestrotomy ... ..	267	200	59	3	5
Osteotomy ... ..	61	49	12	...	...
Trephining ... ..	1	1	...	...	...
Splenectomy ... ..	5	5	...	...	...
Cholecystomy ... ..	2	...	1	...	1
Curettage general ... ..	267	240	24	2	1
Skin Grafting ... ..	263	219	36	8	...
Thoracotomy ... ..	2	2	...	...	...
Tonsillectomy ... ..	12	10	2	...	...
Thyroidectomy ... ..	25	20	1	1	3
Omentopexy ... ..	6	1	5	...	...
Ischio rectal abscess ... ..	11	11	...	...	...
Other operations ... ..	990	847	85	12	46
<b>B. EYES.</b>					
Cataract ... ..	75	43	25	6	1
Enucleation ... ..	28	22	3	3	...
Iridectomy ... ..	12	7	4	1	...
Other operations ... ..	96	87	5	3	1
<b>C. EAR.</b>					
Mastoid Schwartz operation	11	10	1	...	...
Other operations ... ..	22	17	4	1	...
Carried forward ... ..	5,543	4,967	352	64	160



SURGICAL OPERATIONS, 1934—*continued.*

Nature of Operation.		Total.	Cured.	Relieved.	Unrelieved.	Died.
Brought forward ...		5,543	4,967	352	64	160
<b>D. GENITO URINARY, MALE.</b>						
External urethrotomy	...	64	48	14	...	2
Internal urethrotomy	...	7	6	1	...	...
Dilation of stricture	...	817	427	381	4	5
Elephantiasis of scrotum	...	271	238	14	10	9
Hydrocele (radical cure)	...	634	592	35	1	6
Varicocele	...	10	10	...	...	...
Circumcision	...	1,917	1,915	2	...	...
Cystotomy	...	41	33	2	1	5
Orchidectomy	...	28	28	...	...	...
Tumour of bladder	...	...	...	...	...	...
Other operations	...	555	502	46	3	4
<b>E. GENITO URINARY, FEMALE.</b>						
Abdominal hysterectomy	...	28	23	1	...	4
Elephantiasis	...	31	30	...	...	1
Ovariectomy	...	32	30	1	...	1
Salpingectomy	...	19	14	2	1	2
Hysteropexy	...	9	9	...	...	...
Perineorrhaphy	...	20	16	4	...	...
Endometritis (curettage)	...	171	155	16	...	...
Colporrhaphy	...	6	6	...	...	...
Other operations	...	177	119	40	12	6
<b>F. OBSTETRICAL.</b>						
Abortion—curettage	..	36	35	...	...	1
Forceps extraction	...	55	45	...	...	10
Podalic version	...	18	15	...	...	3
Craniotomy	...	16	10	...	...	6
Ectopic gestation	...	4	2	...	...	2
Cæsarian section	...	12	10	...	...	2
Retained placenta (curettage)	...	53	42	3	...	8
Other operations	...	330	309	14	3	4
<b>G. MINOR SURGICAL OPERATIONS.</b>						
Abscesses, general Injuries, etc.		8,717	8,256		38	22
				401		
Totals ...		19,621	17,892	1,329	137	263

**F.—X-RAY DEPARTMENT.**

At Lagos 843 patients were X-rayed, including eighty-three who were X-rayed after bismuth meals which necessitated repeated examinations in each case. Considerable electro-therapeutical work is also carried out.

At Kaduna 256 patients were examined by X-ray during the year and the plant has been in good working order.

X-ray plants at Calabar and at Port Harcourt have been repaired and are now in working order. Plants are also in use at the native administration hospitals at Ibadan and Kano.

## VII.—PRISONS AND ASYLUMS.

The following figures show the general health and the death rate of prisoners in Government gaols during the year, contrasted with figures for the previous two years :—

	Northern Provinces.			Southern Provinces.		
	1932.	1933.	1934.	1932.	1933.	1934.
Average daily number in Prison ... ..	449	452	193	7,074	6,686	7031·51
Total number on sick list ... ..	291	142	187	25,292	25,346	27,268
Total number of days on sick list ... ..	2,753	2,076	2,073	162,943	72,982	47,970
Average daily sick ..	7·36	5·69	5·68	69·11	70·61	75·25
Total number of deaths	4	10	6	97	101	110
Death rate per thousand ... ..	8·9	22·1	12·1	13·7	15·1	15·6

The following table shows the causes of deaths among prisoners :—

Northern Provinces.				Southern Provinces.			
Chronic Nephritis ... ..	...	...	1	Chronic Meningitis ... ..	...	1	
Heart Failure ... ..	...	...	1	Amœbic Dysentery ... ..	...	1	
Pneumonia ... ..	...	...	1	Toxæmia ... ..	...	2	
Syphilis ... ..	...	...	1	Lobar Pneumonia ... ..	...	14	
Smallpox ... ..	...	...	1	Cerebral Thrombosis ... ..	...	1	
Myocarditis ... ..	...	...	1	Bacillary Dysentery ... ..	...	2	
Total ... ..	...	...	6	Acute Amœbic Dysentery ... ..	...	1	
				Acute Enteritis ... ..	...	3	
				Septicæmia ... ..	...	1	
				Acute Intestinal Obstruction ... ..	...	1	
				Acute Tetanus ... ..	...	1	
				Cerebral Hæmorrhage ... ..	...	4	
				Encephalitis Lethargica ... ..	...	1	
				Acute Gastric dilatation ... ..	...	1	
				General Debility ... ..	...	4	
				Pericarditis ... ..	...	1	
				Heart Failure ... ..	...	1	
				Chronic Nephritis ... ..	...	1	
				Multiple Injuries ... ..	...	1	
				Nephritis ... ..	...	1	
				Carried forward ... ..	...	43	
				Brought forward ... ..	...	43	
				Pneumonia ... ..	...	15	
				Bronco-Pneumonia ... ..	...	5	
				Atrophy of the Liver ... ..	...	1	
				Pyæmia ... ..	...	1	
				Uræmia ... ..	...	1	
				Dysentery ... ..	...	6	
				Chronic Myocarditis ... ..	...	1	
				Fracture dislocation vertebra ... ..	...	1	
				Gangrene Intestine ... ..	...	1	
				Pulmonary Tuberculosis ... ..	...	1	
				Mania ... ..	...	3	
				Congestion of the Lungs ... ..	...	1	
				Degeneration of the Liver ... ..	...	2	
				Empyæma ... ..	...	1	
				Septicæmia ... ..	...	4	
				Asthma ... ..	...	1	
				Rheumatism ... ..	...	1	
				Acute delusional Insanity ... ..	...	1	
				Gun shot wound ... ..	...	1	
				Intestinal Obstruction ... ..	...	2	
				Diarrhœa ... ..	...	5	
				Chronic Bronchitis ... ..	...	2	
				Abscess Pulmonary ... ..	...	1	
				Septic Arthritis ... ..	...	1	
				Senility ... ..	...	1	
				Cerebral Abscess ... ..	...	1	
				Acute Pleurisy ... ..	...	1	
				Tertiary Syphilis ... ..	...	1	
				Enteritis ... ..	...	1	
				Pulmonary congestion ... ..	...	1	
				Natural causes ... ..	...	2	
				Total ... ..	...	110	

The position with respect to civil lunatics is still very unsatisfactory. The small civil asylums at Yaba and Calabar are filled to their utmost capacity and in order to accommodate others it has been necessary to declare prison wards in certain prisons as lunatic asylums. Lagos, Calabar and Port Harcourt prisons take the majority of cases in the Southern Provinces and Lokoja prison in the Northern Provinces. There were 121 lunatics in prisons in the Southern Provinces in 1934. A proposal has been made to build an asylum in connection with the Port Harcourt prison and it is hoped that this proposal may be carried out.



COMPARATIVE MONTHLY RAINFALL—LAGOS, 1924-1934.

Month.	YEAR.											
	1924.	1925.	1926.	1927.	1928.	1929.	1930.	1931.	1932.	1933.	1934.	
January ... ..	1.94	1.50	...	2.49	1.77	.02	1.38	0.94	0.02	4.93	0.20	
February ... ..	1.12	0.40	3.00	2.35	2.22	1.46	2.21	1.47	0.44	2.05	...	
March ... ..	5.28	6.61	2.74	2.78	8.20	1.73	3.27	5.89	2.61	4.67	4.75	
April ... ..	7.55	7.00	12.76	3.37	6.96	7.04	5.01	7.16	3.80	3.95	5.73	
May... ..	3.45	12.16	13.69	8.19	15.33	11.34	8.61	8.87	11.34	6.61	5.38	
June... ..	5.53	20.40	13.06	7.08	21.05	24.79	13.28	17.73	14.10	14.86	15.68	
July... ..	2.48	15.22	10.07	8.57	2.53	19.93	18.40	17.81	0.86	19.49	14.49	
August ... ..	0.10	1.28	0.26	0.25	2.05	.81	.66	2.10	3.02	1.51	7.91	
September ... ..	4.10	5.98	11.05	3.04	5.60	3.11	2.67	12.54	4.11	5.49	4.32	
October ... ..	15.62	2.98	3.79	13.33	12.67	6.03	12.46	5.87	5.16	6.01	13.45	
November ... ..	0.83	2.87	5.47	2.38	.54	4.10	1.88	2.24	2.63	5.31	1.17	
December ... ..	1.92	...	0.07	1.17	.13	6.02	1.69	0.93	...	0.97	4.72	
Total ... ..	49.92	76.40	75.97	55.00	79.05	86.38	71.52	83.55	48.09	75.85	77.80	

TABLE III.

## METEOROLOGICAL RETURNS FOR 1934.

STATION.	Absolute Shade Max.	Absolute Shade Min.	Average Max.	Average Min.	Relative Humidity.	Rainfall inches.
Ilorin ... ..	100	44	95·5	57·6	79·5	44·17
Kaduna ... ..	105	50	94·5	60·1	68·3	53·38
Maiduguri ... ..	111	48	102·7	60·6	55·5	31·57
Kano ... ..	108	50	98·5	61·08	49·6	32·70
Lokoja ... ..	99	53	96·1	66·4	83·3	70·68
Yola ... ..	106	59	90·2	66·2	64	44·00
Lagos ... ..	92	67	89·4	70·5	86·5	77·80
Ibadan ... ..	96	57	90·4	64·5	90·7	50·08
Calabar ... ..	94	55	90·5	61·5	91·5	95·26
Enugu ... ..	101	64	93·8	66·5	81·08	81·26

**IX.—SCIENTIFIC.**

The following reports appear as appendices :—

A.—Report upon Laboratory Service.

B.—Report upon Tsetse Investigation and Sleeping Sickness work.

C.—Report upon Medical School.

D.—Report upon Dietetics Research.

W. B. JOHNSON,

*Director of Medical and Sanitary Service.*



# RETURNS.





**TABLE IV.**  
**RETURN OF DISEASES AND DEATHS (EUROPEAN)**  
**FOR THE YEAR 1934.**

Diseases.			IN-PATIENTS.					OUT-PATIENTS.			
			Remaining in Hospital at end of 1933.	TOTAL.			Total cases treated.	Remaining in Hospital at end of 1934.	Male.	Female.	Deaths.
				Admissions.		Deaths.					
				Male.	Female.						
I.—Epidemic, Endemic, and Infectious Diseases.											
1. Enteric Group—											
(a) Typhoid Fever	...	...	5	1	1	6	...	2	1	...	
(b) Paratyphoid A.	...	...	1	...	...	1	...	...	...	...	
(c) Paratyphoid B.	...	...	...	...	...	...	...	...	...	...	
(d) Type not defined	...	1	1	...	...	2	...	1	...	...	
2. Typhus	...	...	...	...	...	...	...	...	...	...	
3. Relapsing Fever	...	...	...	...	...	...	...	...	...	...	
4. Undulant Fever	...	...	...	...	...	...	...	...	...	...	
5. Malaria—											
Type undefined	...	...	...	...	...	...	...	...	...	...	
(a) Tertian	...	...	...	...	...	...	...	...	...	...	
(b) Quartan	...	...	1	1	...	2	...	...	...	...	
(c) Aestivo-autumnal	...	3	204	42	2	249	3	609	160	...	
(d) Cachexia	...	...	1	...	...	1	...	4	...	...	
(e) Blackwater	...	1	8	1	4	10	...	5	1	1	
6. Smallpox	...	...	...	1	...	1	...	1	...	...	
Alastrim	...	...	...	...	...	...	...	...	...	...	
7. Measles	...	...	2	...	...	2	...	6	7	...	
8. Scarlet Fever	...	...	...	...	...	...	...	...	...	...	
9. Whooping Cough	...	...	...	...	...	...	...	...	...	...	
10. Diphtheria	...	...	2	...	1	2	1	1	...	...	
11. Influenza	...	1	16	2	1	19	2	66	14	...	
12. Miliary Fever	...	...	...	...	...	...	...	...	...	...	
13. Mumps	...	...	...	...	...	...	...	2	1	...	
14. Cholera	...	...	...	...	...	...	...	...	...	...	
15. Epidemic diarrhoea	...	...	...	...	...	...	...	...	...	...	
16. Dysentery—											
(a) Amœbic	...	1	16	10	...	27	...	28	11	...	
(b) Bacillary	...	1	3	7	...	11	...	2	1	...	
(c) Undefined or due to other causes	...	...	7	3	...	10	1	16	3	...	
17. Plague—											
(a) Bubonic	...	...	...	...	...	...	...	...	...	...	
(b) Pneumonic	...	...	...	...	...	...	...	...	...	...	
(c) Septicaemic	...	...	...	...	...	...	...	...	...	...	
(d) Undefined	...	...	...	...	...	...	...	...	...	...	
18. Yellow Fever	...	...	3	...	1	3	...	...	...	...	
19. Spirochætosis ictero-hæmorrhagica	...	...	...	...	...	...	...	...	...	...	
20. Leprosy	...	...	...	...	...	...	...	...	...	...	
21. Erysipelas	...	...	2	...	...	2	...	1	...	...	
22. Acute Poliomyelitis	...	...	1	...	...	1	1	2	...	...	
23. Encephalitis Lethargica	...	...	...	...	...	...	...	...	...	...	
24. Epidemic Cerebro-spinal Fever	...	...	...	...	...	...	...	...	...	...	
25. Other Epidemic Diseases—											
(a) Rubeola (German Measles)	...	...	6	1	...	7	...	7	4	...	
(b) Varicella (Chicken-pox)	...	...	3	...	...	3	2	2	...	...	
(c) Kala-azar	...	...	...	...	...	...	...	...	...	...	
(d) Phlebotomus Fever	...	...	...	...	...	...	...	...	...	...	
Carried forward	...	8	282	69	10	359	10	755	203	1	

TABLE IV.—RETURN OF DISEASES AND DEATHS (EUROPEAN)

FOR THE YEAR 1934—continued.

Diseases.	IN-PATIENTS.					Remaining in Hospital at end of 1934.	OUT-PATIENTS.		
	Remaining in Hospital at end of 1933.	TOTAL.		Deaths.	Total cases treated.		Male.	Female.	Deaths.
		Admissions.							
		Male.	Female.						
Brought forward ...	8	282	69	10	359	10	755	203	1
I.— <i>Epidemic, Endemic, and Infectious Diseases</i> —contd.									
Other Epidemic Diseases—									
(e) Dengue ...	...	5	2	...	7	1	13	5	...
(f) Epidemic Dropsy ...	...	...	...	...	...	...	...	...	...
(g) Yaws ...	...	...	...	...	...	...	...	...	...
(h) Trypanosomiasis ...	...	...	2	...	2	...	...	1	...
26. Glanders ...	...	...	...	...	...	...	...	...	...
27. Anthrax ...	...	...	...	...	...	...	...	...	...
28. Rabies ...	...	...	...	...	...	...	...	...	...
28a. Anti Rabid Prophylaxis ...	...	...	...	...	...	...	19	8	...
29. Tetanus ...	...	...	...	...	...	...	...	...	...
30. Mycosis ...	...	...	...	...	...	...	...	...	...
31. Tuberculosis, Pulmonary and Laryngeal ...	...	3	...	...	3	...	1	...	...
32. Tuberculosis of the Meninges or Central Nervous System ...	...	...	...	...	...	...	...	...	...
33. Tuberculosis of the Intestines or Peritoneum ...	...	...	...	...	...	...	...	...	...
34. Tuberculosis of the Vertebral Column ...	...	...	...	...	...	...	...	...	...
35. Tuberculosis of Bones and Joints ...	...	...	...	...	...	...	...	...	...
36. Tuberculosis of other organs—									
(a) Skin or Subcutaneous Tissue (Lupus) ...	...	...	...	...	...	...	...	...	...
(b) Bones ...	...	1	...	...	1	...	1	...	...
(c) Lymphatic System ...	...	...	...	...	...	...	...	...	...
(d) Genito-urinary ...	...	...	...	...	...	...	...	...	...
(e) Other Organs ...	...	...	...	...	...	...	...	...	...
37. Tuberculosis disseminated—									
(a) Acute ...	...	...	...	...	...	...	1	...	...
(b) Chronic ...	...	...	...	...	...	...	...	...	...
38. Syphilis—									
(a) Primary ...	...	1	...	...	1	...	11	...	...
(b) Secondary ...	...	...	...	...	...	...	10	...	...
(c) Tertiary ...	...	...	...	...	...	...	10	...	...
(d) Hereditary ...	...	...	...	...	...	...	...	...	...
(e) Period not indicated ...	...	...	...	...	...	...	1	...	...
39. Soft Chancre ...	1	2	...	...	3	...	48	...	...
40. A.—Gonorrhœa and its complications ...									
B.—Gonorrhœal Ophthalmia ...	...	6	...	...	7	...	81	...	...
C.—Gonorrhœal Arthritis ...	...	2	...	...	2	...	5	...	...
D.—Granuloma Venereum ...	...	...	...	...	...	...	...	...	...
41. Septicaemia ...	1	2	1	...	4	...	...	...	...
Filariasis ...	...	...	...	...	...	...	19	4	...
42. Other Infectious Diseases ...	...	...	...	...	...	...	...	...	...
II.— <i>General Diseases not mentioned above.</i>									
43. Cancer or other malignant Tumours of the Buccal Cavity ...	...	...	...	...	...	...	...	...	...
Carried forward ...	11	304	74	10	389	11	975	221	1



TABLE IV.—RETURN OF DISEASES AND DEATHS (EUROPEAN)

FOR THE YEAR 1934—*continued*.

Diseases.	IN-PATIENTS.						OUT-PATIENTS.		
	Remaining in Hospital at end of 1933.	TOTAL.			Total cases treated.	Remaining in Hospital at end of 1934.	Male.	Female.	Deaths.
		Admissions.		Deaths.					
		Male.	Female.						
Brought forward ... ..	11	304	74	10	389	11	975	221	1
II.—General Diseases not men- tioned above—contd.									
44. Cancer or other malignant Tumours of the Stomach or Liver ... ..	...	...	...	...	...	...	...	...	...
45. Cancer or other malignant Tumours of the Peritoneum intestines, Rectum ... ..	...	...	...	...	...	...	...	...	...
46. Cancer or other malignant Tumours of the Female Geni- tal Organs ... ..	...	...	...	...	...	...	...	...	...
47. Cancer or other malignant Tumours of the Breast ... ..	...	...	...	...	...	...	...	...	...
48. Cancer or other malignant Tumours of the Skin ... ..	...	...	...	...	...	...	...	...	...
49. Cancer or other malignant Tumours of Organs not specified ... ..	...	...	...	...	...	...	...	...	...
50. Tumours non-Malignant ... ..	...	3	...	...	3	...	24	5	...
51. Acute Rheumatism ... ..	...	4	...	...	4	...	3	...	...
52. Chronic Rheumatism ... ..	1	9	...	...	10	1	157	24	...
53. Scurvy (including Barlow's Disease) ... ..	...	...	...	...	...	...	1	...	...
54. Pellagra ... ..	...	...	...	...	...	...	...	...	...
55. Beri-Beri ... ..	...	...	...	...	...	...	...	...	...
56. Rickets ... ..	...	...	...	...	...	...	...	...	...
57. Diabetes (not including Insi- pidus) ... ..	...	...	1	...	1	...	...	...	...
58. Anæmia-- (a) Pernicious ... .. (b) Other Anæmias and Chlo- rosis ... ..	...	...	...	...	...	...	...	...	...
59. Diseases of the Pituitary Body ... ..	...	4	4	...	8	...	120	48	...
60. Diseases of the Thyroid Gland— (a) Exophthalmic Goitre ... .. (b) Other diseases of the Thyroid Gland, Myxœ- dema ... ..	...	...	...	...	...	...	...	...	...
61. Diseases of the Para-Thyroid Glands... ..	...	...	...	...	...	...	1	...	...
62. Diseases of the Thymus ... ..	...	...	...	...	...	...	...	...	...
63. Diseases of the Supra-Renal Glands ... ..	...	...	...	...	...	...	...	...	...
64. Diseases of the Spleen ... ..	...	1	...	...	1	...	5	...	...
65. Leukæmia— (a) Leukæmia ... .. (b) Hodgkin's Disease ... ..	...	...	...	...	...	...	...	...	...
66. Alcoholism ... ..	...	3	...	1	3	...	1	...	...
67. Chronic poisoning by mineral substances (lead, mercury, &c.) ... ..	...	...	...	...	...	...	...	...	...
68. Chronic poisoning by organic substances (Morphia, Cocaine, &c.) ... ..	...	...	...	...	...	...	...	...	...
Carried forward ... ..	12	329	79	11	420	13	1,287	298	1

TABLE IV.—RETURN OF DISEASES AND DEATHS (EUROPEAN)

FOR THE YEAR 1934—*continued*.

Diseases.	IN-PATIENTS.						OUT-PATIENTS.		
	Remaining in Hospital at end of 1933.	TOTAL.		Deaths.	Total cases treated.	Remaining in Hospital at end of 1934.	Male.	Female.	Deaths.
		Admissions.							
		Male.	Female.						
Brought forward ... ..	12	329	79	11	420	13	1,287	298	1
II.— <i>General Diseases not mentioned above—contd.</i>									
69. Other General Diseases—									
Auto-intoxication ... ..	...	...	1	...	1	...	1	...	...
Purpura Hæmorrhagica ... ..	...	...	...	...	...	...	...	...	...
Hæmophilia ... ..	...	...	...	...	...	...	...	...	...
Diabetes Insipidus ... ..	...	...	...	...	...	...	...	...	...
III.— <i>Affections of the Nervous System and Organs of the Senses.</i>									
70. Encephalitis (not including Encephalitis Lethargica) ... ..	...	1	...	...	1	...	...	...	...
71. Meningitis (not including Tuberculous Meningitis or Cerebro-spinal Meningitis) ... ..	...	...	...	...	...	...	...	...	...
72. Locomotor Ataxia ... ..	...	...	...	...	...	...	...	...	...
73. Other affections of the Spinal Cord ... ..	...	...	...	...	...	...	1	...	...
74. Apoplexy—									
(a) Hæmorrhage ... ..	...	1	...	...	1	...	...	...	...
(b) Embolism ... ..	...	...	...	...	...	...	...	...	...
(c) Thrombosis ... ..	...	...	...	...	...	...	...	...	...
75. Paralysis—									
(a) Hemiplegia ... ..	...	...	...	...	...	...	...	...	...
(b) Other Paralyzes ... ..	...	1	...	...	1	...	2	...	...
76. General Paralysis of the Insane ... ..	...	...	...	...	...	...	...	...	...
77. Other forms of mental Alienation ... ..	...	3	1	...	4	...	2	...	...
78. Epilepsy ... ..	...	...	...	...	...	...	...	...	...
79. Eclampsia, Convulsions (non- puerperal) 5 years or over ... ..	...	...	...	...	...	...	...	...	...
80. Infantile Convulsions ... ..	...	...	...	...	...	...	...	...	...
81. Chorea ... ..	...	...	...	...	...	...	1	...	...
82. A.—Hysteria ... ..	...	1	...	...	1	...	5	3	...
B.—Neuritis ... ..	...	3	...	...	3	...	45	10	...
C.—Neurasthenia ... ..	...	16	5	1	21	...	67	16	...
83. Cerebral Softening ... ..	...	...	...	...	...	...	...	...	...
84. Other affections of the Ner- vous System, such as Paralysis Agitans ... ..	...	...	1	...	1	...	3	...	...
85. Affections of the Organs of Vision—									
(a) Diseases of the eye ... ..	...	2	...	...	2	...	12	1	...
(b) Conjunctivitis ... ..	...	3	...	...	3	...	66	13	...
(c) Trachoma ... ..	...	...	...	...	...	...	...	...	...
(d) Tumours of the Eye ... ..	...	...	...	...	...	...	1	...	...
(e) Other affections of the Eye ... ..	...	6	...	...	6	1	57	7	...
86. Affections of the Ear or Mastoid Sinus ... ..	...	5	1	...	6	...	364	70	...
Carried forward ... ..	12	371	88	12	471	14	1,914	418	1



TABLE IV.—RETURN OF DISEASES AND DEATHS (EUROPEAN)

FOR THE YEAR 1933—*continued.*

Diseases.			IN-PATIENTS.					OUT-PATIENTS.			
			Remaining in Hospital at end of 1933.	TOTAL.		Total cases treated.	Remaining in Hospital at end of 1934.	Male.	Female.	Deaths.	
				Admissions.							Deaths.
				Male.	Female.						
Brought forward ...			12	371	88	12	471	14	1,914	418	1
IV.— <i>Affections of the Circulatory System</i>											
87. Pericarditis ...			...	...	...	...	...	...	...	...	...
88. Acute Endocarditis or Myo- carditis ...			...	...	...	...	...	...	1	...	...
89. Angina Pectoris ...			...	...	...	...	...	...	1	...	...
90. Other Diseases of the Heart—											
(a) Valvular ...			...	...	...	...	...	...	2	...	...
Mitral ...			...	3	...	1	3	...	6	3	...
Aortic ...			...	...	...	...	...	...	...	...	...
Tricuspid ...			...	...	...	...	...	...	...	...	...
Pulmonary ...			...	...	...	...	...	...	...	...	...
(b) Myocarditis ...			...	5	...	3	5	...	9	...	...
91. Diseases of the Arteries —											
(a) Aneurism ...			...	...	...	...	...	...	...	...	...
(b) Arterio-Sclerosis ...			...	...	...	...	...	...	1	...	...
(c) Other diseases ...			...	...	...	...	...	...	2	...	...
92. Embolism or Thrombosis (non- cerebral) ...			...	2	...	1	2	...	...	...	...
93. Diseases of the Veins—											
Hæmorrhoids... ..			...	7	...	...	7	...	60	7	...
Varicose Veins... ..			...	...	...	...	...	...	4	1	...
Phlebitis ... ..			...	3	...	...	3	...	17	...	...
94. Diseases of the Lymphatic System— ... ..			...	...	...	...	...	...	1	...	...
Lymphangitis ... ..			1	...	...	...	1	...	10	1	...
Lymphadenitis, Bubo (non- specific) ... ..			1	10	...	...	11	1	32	6	...
95. Hæmorrhage of undetermined cause ... ..			...	...	...	...	...	...	1	...	...
96. Other affections of the Circula- tory System ... ..			...	...	...	...	...	...	5	3	...
V.— <i>Affections of the Respiratory System.</i>											
97. Diseases of the Nasal Passages—											
Adenoids ... ..			...	...	...	...	...	...	1	...	...
Polypus ... ..			...	...	...	...	...	...	...	...	...
Rhinitis ... ..			...	2	...	...	2	...	21	5	...
Coryza ... ..			...	7	...	...	7	...	180	27	...
98. Affections of the Larynx—											
Laryngitis ... ..			...	...	2	...	2	...	32	16	...
99. Bronchitis—											
(a) Acute ... ..			...	10	1	...	11	1	94	6	...
(b) Chronic ... ..			...	1	...	...	1	...	20	2	...
100. Broncho-Pneumonia ... ..			1	1	...	...	2	...	2	...	...
101. Pneumonia—											
(a) Lobar ... ..			..	4	1	...	5	...	2	...	...
(b) Unclassified ... ..			1	2	...	...	3	...	...	...	...
102. Pleurisy, Empyema ... ..			1	4	...	...	5	...	5	...	...
103. Congestion of the Lungs ... ..			...	...	...	...	..	...	...	...	...
104. Gangrene of the Lungs ... ..			...	...	...	...	...	...	...	...	...
105. Asthma ... ..			...	10	1	...	11	...	34	1	...
106. Plumonary Emphysema ... ..			...	...	...	...	...	...	...	...	...
107. Other affections of the Lungs— Pulmonary Spirochaetosis			...	...	...	...	...	...	...	...	...
Carried forward ... ..			17	442	93	17	552	16	2,457	496	1

TABLE IV.--RETURN OF DISEASES AND DEATHS (EUROPEAN)  
FOR THE YEAR 1934--continued.

Diseases.				IN-PATIENTS.					OUT-PATIENTS.				
				Remaining in Hospital at end of 1933.	TOTAL.		Deaths.	Total cases treated.	Remaining in Hospital at end of 1934.	Male.	Female.	Deaths.	
					Admissions.								
					Male.	Female.							
Brought forward ... ..				17	442	93	17	552	16	2,457	496	1	
VI.—Diseases of the Digestive System.													
108. A.—Diseases of Teeth or Gums—													
Caries, Pyorrhœa, &c. ...				...	20	7	...	27	...	228	54	...	
B.—Other affections of the Mouth—													
Stomatitis ... ..				...	2	1	...	3	...	26	8	...	
Glossitis, &c. ... ..				...	...	...	...	...	...	2	1	...	
109. Affections of the Pharynx or Tonsils—													
Tonsillitis ... ..				2	24	7	...	33	1	96	30	...	
Pharyngitis ... ..				1	7	...	2	8	...	90	18	...	
110. Affections of the Œsophagus ...				...	...	...	...	...	...	...	1	...	
111. A.—Ulcer of the Stomach ...				...	...	...	...	...	...	...	...	...	
B.—Ulcer of the Duodenum ...				...	12	...	...	12	...	24	...	...	
112. Other affections of the Stomach—													
Gastritis ... ..				...	14	3	...	17	...	109	18	...	
Dyspepsia, &c. ... ..				...	11	8	...	19	...	196	32	...	
113. Diarrhœa and Enteritis—													
Under two years ... ..				...	...	...	...	...	...	4	...	...	
114. Diarrhœa and Enteritis—													
Two years and over ... ..				...	30	8	...	38	...	195	70	...	
Colitis ... ..				...	9	3	...	12	...	21	9	...	
Ulceration ... ..				...	...	...	...	...	...	...	...	...	
114a. Sprue ... ..				...	...	...	...	...	...	...	...	...	
115. Ankylostomiasis ... ..				...	...	...	...	...	...	2	1	...	
116. Diseases due to Intestinal Parasites—													
(a) Cestoda (Tænia) ... ..				...	...	...	...	...	...	12	2	...	
(b) Trematoda (Flukes) ... ..				...	...	...	...	...	...	...	...	...	
(c) Nematoda (other than Ankylostoma) ... ..				...	...	...	...	...	...	3	1	...	
Ascaris ... ..				...	...	...	...	...	...	12	2	...	
Trichocephalus dispar ... ..				...	...	...	...	...	...	...	...	...	
Trichina ... ..				...	...	...	...	...	...	...	...	...	
Dracunculus ... ..				...	...	...	...	...	...	...	...	...	
Strongylus ... ..				...	...	...	...	...	...	...	...	...	
Oxyuris ... ..				...	1	...	...	1	...	2	...	...	
(d) Coccidia ... ..				...	...	...	...	...	...	...	...	...	
(e) Other parasites ... ..				...	...	...	...	...	...	2	...	...	
(f) Unclassified ... ..				...	...	...	...	...	...	...	...	...	
117. Appendicitis ... ..				2	25	3	...	30	1	17	5	...	
118. Hernia ... ..				...	2	...	...	2	...	9	...	...	
119. A.—Affections of the Anus, Fistula, &c. ... ..				...	4	...	...	4	...	9	1	...	
B.—Other affections of the Intestines ... ..				...	1	...	...	1	...	...	...	...	
Enteroptosis ... ..				...	...	2	...	2	...	...	...	...	
Constipation ... ..				...	2	...	...	2	...	74	26	...	
120. Acute Yellow Atrophy of the Liver ... ..				...	...	...	...	...	...	...	...	...	
121. Hydatid of the Liver ... ..				...	...	...	...	...	...	...	...	...	
Carried forward ... ..				22	606	135	19	763	18	3,590	775	1	



TABLE IV.—RETURN OF DISEASES AND DEATHS (EUROPEAN)  
FOR THE YEAR 1934—*continued*.

Diseases.				IN-PATIENTS.					OUT-PATIENTS.			
				Remaining in Hospital at end of 1933.	TOTAL			Total cases treated.	Remaining in Hospital at end of 1934.	Male.	Female.	Deaths.
					Admissions.		Deaths.					
					Male.	Female.						
Brought forward ... ..				22	606	135	19	763	18	3,590	775	1
VI.— <i>Diseases of the Digestive System</i> —continued.												
122. Cirrhosis of the Liver—												
(a) Alcoholic ... ..				...	...	...	...	...	...	1	...	...
(b) Other forms ... ..				...	1	...	...	1	...	...	...	...
123. Biliary Calculus ... ..				...	...	...	...	...	...	...	...	...
124. Other affections of the Liver—												
Abscess ... ..				...	...	...	...	...	...	...	...	...
Hepatitis ... ..				...	9	1	...	10	...	16	2	...
Cholecystitis... ..				...	...	...	...	...	...	1	1	...
Jaundice ... ..				1	7	...	...	8	...	16	...	...
125. Diseases of the Pancreas ... ..				...	...	...	...	...	...	1	...	...
126. Peritonitis (of unknown cause)				...	1	1	...	2	...	1	...	...
127. Other affections of the Digestive System ... ..				...	4	2	...	6	...	10	5	...
VII.— <i>Diseases of the Genito-urinary System (non-Venereal)</i> .												
128. Acute Nephritis ... ..				...	1	...	1	1	...	4	...	...
129. Chronic ... ..				...	...	1	1	1	...	1	...	...
130. A.—Chyluria ... ..				...	...	...	...	...	...	...	...	...
B.—Schistosomiasis ... ..				...	...	...	...	...	...	2	...	...
131. Other affections of the Kidneys—				...	...	1	...	1	...	1	...	...
Pyelitis, &c. ... ..				...	4	2	...	6	1	9	1	...
132. Urinary Calculus ... ..				...	8	...	...	8	...	7	...	...
133. Diseases of the Bladder—				...	...	...	...	...	...	...	1	...
Cystitis ... ..				1	7	11	...	19	...	38	24	...
134. Diseases of the Urethra—												
(a) Stricture ... ..				...	1	...	...	1	...	16	...	...
(b) Other ... ..				1	1	...	...	2	1	40	1	...
135. Diseases of the Prostate—												
Hypertrophy ... ..				...	...	...	...	...	...	2	...	...
Prostatitis ... ..				...	1	...	...	1	...	13	...	...
136. Diseases (non-Venereal) of the Genital Organs of Man ... ..				...	1	...	...	1	...	1	...	...
Epididymitis ... ..				1	9	...	...	10	...	11	...	...
Orchitis ... ..				...	2	...	...	2	...	8	...	...
Hydrocele ... ..				...	1	...	...	1	...	4	...	...
Ulcer of Penis ... ..				...	2	...	...	2	...	4	...	...
Phimosis ... ..				...	...	...	...	...	...	2	...	...
137. Cysts or other non-malignant Tumours of the Ovaries ... ..				...	...	...	...	...	...	...	...	...
138. Salpingitis—				...	...	...	...	...	...	...	1	...
Abscess of the Pelvis ... ..				...	...	...	...	...	...	...	1	...
139. Uterine Tumours (non-malignant) ... ..				...	...	2	...	2	...	...	1	...
140. Uterine Hæmorrhage (non-puerperal) ... ..				...	...	2	...	2	...	...	6	...
141. A.—Metritis ... ..				...	...	5	...	5	...	...	2	...
B.—Other affections of the Female Genital Organs—												
Displacements of Uterus ... ..				...	...	...	...	...	...	...	6	...
Amenorrhœa ... ..				...	...	...	...	...	...	...	25	...
Dysmenorrhœa ... ..				...	...	2	...	2	...	...	21	...
Leucorrhœa ... ..				...	...	...	...	...	...	...	1	...
Carried forward ... ..				26	666	165	21	857	20	3,799	874	1

TABLE IV.—RETURN OF DISEASES AND DEATHS (EUROPEAN)  
FOR THE YEAR 1934—*continued*.

Diseases.	Remaining in Hospital at end of 1933.	IN-PATIENTS.					OUT-PATIENTS.		
		TOTAL.			Total cases treated.	Remaining in Hospital at end of 1934.	Male.	Female.	Deaths
		Admissions.		Deaths.					
		Male.	Female.						
Brought forward ... ..	26	666	165	21	857	20	3,799	874	1
VII.— <i>Diseases of the Genito-urinary System (non-Venereal)</i> —contd.									
142. Diseases of the Breast (non-puerperal)—	...	...	...	...	...	...	...	1	...
Mastitis ... ..	...	...	...	...	...	...	...	2	...
Abscess of Breast ... ..	...	...	...	...	...	...	2	...	...
VIII.— <i>Puerperal State.</i>									
143. A.—Normal Labour ... ..	...	...	3	...	3	...	...	1	...
B.—Accidents of Pregnancy—									
(a) Abortion ... ..	...	...	8	...	8	...	...	18	...
(b) Ectopic Gestation ... ..	...	...	1	...	1	...	...	4	...
(c) Other accidents of Pregnancy ... ..	...	...	3	...	3	...	...	14	...
144. Puerperal Hæmorrhage ... ..	...	...	...	...	...	...	...	...	...
145. Other accidents of Parturition	...	...	...	...	...	...	...	1	...
146. Puerperal Septicæmia ... ..	...	...	...	...	...	...	...	...	...
147. Phlegmasia Dolens ... ..	...	...	...	...	...	...	...	...	...
148. Puerperal Eclampsia ... ..	...	...	...	...	...	...	...	...	...
149. Sequelæ of Labour ... ..	...	...	...	...	...	...	...	...	...
150. Puerperal affections of the Breast ... ..	...	...	...	...	...	...	...	...	...
IX.— <i>Affections of the Skin and Cellular Tissues.</i>									
151. Gangrene ... ..	...	...	...	...	...	...	...	...	...
152. Boil ... ..	1	13	1	...	15	...	150	24	...
Carbuncle ... ..	...	9	2	...	11	...	56	7	...
153. Abscess ... ..	...	13	1	...	14	2	41	3	...
Whitlow ... ..	...	4	...	...	4	1	36	5	...
Cellulitis ... ..	1	14	5	...	20	...	85	21	...
154. A.—Tinea ... ..	...	...	2	...	2	...	188	12	...
B.—Scabies ... ..	...	1	1	...	2	...	28	4	...
155. Other Diseases of the Skin	...	1	...	...	1	...	44	12	...
Brythema ... ..	...	...	...	...	...	...	20	4	...
Urticaria ... ..	...	2	...	...	2	...	39	10	...
Eczema ... ..	1	3	3	1	7	...	141	28	...
Herpes ... ..	...	1	...	...	1	...	23	3	...
Psoriasis ... ..	...	...	...	...	...	...	6	1	...
Elephantiasis ... ..	...	...	...	...	...	...	...	...	...
Ulcers ... ..	...	6	...	...	6	1	187	49	...
Myiasis ... ..	...	...	...	...	...	...	22	11	...
Chigoes ... ..	...	...	...	...	...	...	3	6	...
Cutaneous Leishmaniasis ... ..	...	...	...	...	...	...	...	...	...
X.— <i>Diseases of Bones and Organs of Locomotion (other than Tuberculous).</i>									
156. Diseases of Bones --									
Osteitis ... ..	...	2	1	...	3	1	5	1	...
157. Diseases of Joints—									
Arthritis ... ..	...	1	...	...	1	...	28	1	...
Synovitis ... ..	...	2	...	...	2	...	37	...	...
158. Other Diseases of Bones or Organs of Locomotion ... ..	...	1	...	...	1	...	47	4	...
Carried forward ... ..	29	739	196	22	964	25	4,987	1,122	1



TABLE IV.—RETURN OF DISEASES AND DEATHS (EUROPEAN)

FOR THE YEAR 1934—continued.

Diseases.				IN-PATIENTS.					OUT-PATIENTS			
				Remaining in Hospital at end of 1933.	TOTAL.		Deaths.	Total cases treated.	Remaining in Hospital at end of 1934.	Male.	Female.	Deaths
					Admissions.							
					Male.	Female.						
Brought forward	...	...	29	739	196	22	964	25	4,987	1,122	1	
XI.—Malformations.												
159.	Malformations—											
	Hydrocephalus	...	...	...	...	...	...	...	...	...	...	
	Hypospadias...	...	...	...	...	...	...	...	...	...	...	
	Spina Bifida, etc.	...	...	...	...	...	...	...	...	...	...	
XII.—Diseases of Infancy.												
160.	Congenital Debility	...	...	...	...	...	...	...	...	...	...	
161.	Premature Birth	...	...	...	...	...	...	...	...	...	...	
162.	Other affections of infancy	...	...	...	...	...	...	...	...	12	...	
163.	Infant neglect (infants of three months or over)	...	...	...	...	...	...	...	...	...	...	
XIII.—Affections of Old Age.												
164.	Senility—											
	Senile Dementia	...	...	...	...	...	...	...	...	...	...	
XIV.—Affections produced by External Causes.												
165.	Suicide by Poisoning	...	...	...	...	...	...	...	...	...	...	
166.	Corrosive Poisoning (Inten- tional)...	...	...	...	...	...	...	...	...	...	...	
167.	Suicide by Gas Poisoning	...	...	...	...	...	...	...	...	...	...	
168.	Suicide by Hanging or Stran- gulation	...	...	...	...	...	...	...	...	...	...	
169.	Suicide by Drowning	...	...	...	...	...	...	...	...	...	...	
170.	Suicide by Firearms	...	...	...	...	...	...	...	...	...	...	
171.	Suicide by cutting or stabbing instruments	...	...	...	...	...	...	...	...	...	...	
172.	Suicide by jumping from a height...	...	...	...	...	...	...	...	...	...	...	
173.	Suicide by crushing	...	...	...	...	...	...	...	...	...	...	
174.	Other Suicides	...	...	...	...	...	...	...	...	...	...	
175.	Food Poisoning	...	...	...	1	...	1	...	15	6	...	
	Botulism	...	...	...	...	...	...	...	...	...	...	
176.	Attacks of poisonous animals											
	Snake Bite	...	...	1	...	...	1	...	1	...	...	
	Insect Bite	...	...	1	...	...	1	...	28	15	...	
177.	Other accidental Poisonings	...	...	...	...	...	...	...	3	...	...	
178.	Burns (by Fire)	...	...	2	...	...	2	...	7	1	...	
179.	Burns (other than by Fire)	...	...	2	...	...	2	...	5	2	...	
180.	Suffocation (accidental)	...	...	...	...	...	...	...	...	...	...	
181.	Poisoning by Gas (accidental)	...	...	...	...	...	...	...	...	...	...	
182.	Drowning (accidental)...	...	...	...	...	...	...	...	...	...	...	
183.	Wounds (by Firearms, war excepted)	...	...	...	...	...	...	...	2	...	...	
184.	Wounds (by cutting or stabbing instruments)...	...	...	7	1	...	8	...	25	8	...	
185.	Wounds (by Fall)	...	...	10	...	...	10	...	99	5	...	
186.	Wounds (in Mines or Quarries)	...	...	...	...	...	...	...	...	...	...	
187.	Wounds (by Machinery)	...	...	2	...	...	2	...	3	...	...	
188.	Wounds (crushing, e.g. railway accidents, &c.)	...	...	1	...	...	1	...	2	1	...	
Carried forward				29	766	197	22	992	25	5,177	1,172	1

TABLE IV.—RETURN OF DISEASES AND DEATHS (EUROPEAN)  
FOR THE YEAR 1934—continued.

Diseases.	IN-PATIENTS.						OUT-PATIENTS.		
	Remaining in Hospital at end of 1933.	TOTAL.			Total cases treated.	Remaining in Hospital at end of 1934.	Male.	Female.	Deaths.
		Admissions.		Deaths.					
		Male.	Female.						
Brought forward ... ..	29	766	197	22	992	25	5,177	1,172	1
XIV.—Affections produced by External Causes—contd.									
189. Injuries inflicted by Animals, Bites, Kicks, &c. ... ..	...	...	...	...	...	...	35	5	...
190. Wounds inflicted on Active Service ... ..	...	...	...	...	...	...	...	...	...
191. Executions of civilians by belligerents ... ..	...	...	...	...	...	...	...	...	...
192. A.—Over fatigue ... ..	...	1	...	...	1	...	6	...	...
B.—Hunger or Thirst ... ..	...	...	...	...	...	...	...	...	...
193. Exposure to Cold, Frost bite, &c. ... ..	...	...	...	...	...	...	...	...	...
194. Exposure to Heat— Heatstroke ... ..	...	1	...	...	1	...	3	1	..
Sunstroke ... ..	...	2	1	...	3	...	8	...	...
195. Lightning Stroke ... ..	...	...	...	...	...	...	...	...	...
196. Electric Shock ... ..	...	...	...	...	...	...	...	...	...
197. Murder by Firearms ... ..	...	...	...	...	...	...	...	...	...
198. Murder by cutting or stabbing instruments ... ..	...	...	...	...	...	...	...	...	...
199. Murder by other means ... ..	...	...	...	...	...	...	...	...	...
200. Infanticide (Murder of an infant under one year) ... ..	...	...	...	...	...	...	...	...	...
201. A.—Dislocation ... ..	...	4	1	...	5	...	13	1	...
B.—Sprain ... ..	...	4	1	...	5	...	107	10	...
C.—Fracture ... ..	1	16	1	...	18	...	36	6	1
202. Other External Injuries ... ..	1	15	1	1	17	1	221	23	...
203. Deaths by Violence of un- known cause ... ..	...	...	...	...	...	...	...	...	...
XV.—Ill-Defined Diseases.									
204. Sudden Death (cause unknown)	...	...	...	...	...	...	...	...	...
205. A.—Diseases not already speci- fied or ill-defined—									
Ascites ... ..	...	...	...	...	...	...	...	...	...
Œdema ... ..	...	...	1	...	1	...	2	...	...
Asthenia ... ..	...	13	3	...	16	...	109	17	...
Shock ... ..	...	1	...	...	1	...	4	...	...
Hyperpyrexia ... ..	...	2	...	...	2	...	1	1	...
B.—Malingering ... ..	...	...	...	...	...	...	...	...	...
Pyrexia of uncertain origin	...	3	...	...	3	...	10	...	...
XVI.—Diseases, the total of which have not caused 10 Deaths—									
Total ... ..	31	828	206	23	1,065	26	5,732	1,236	2
Ante Natal Cases ... ..	...	..	1	...	1	...	37	15	...



TABLE V.

RETURN OF DISEASES AND DEATHS (NON-EUROPEAN)  
FOR THE YEAR 1934.

Diseases.				IN-PATIENTS.					OUT-PATIENTS.					
				Remaining in Hospital at end of 1933.	TOTAL.		Deaths.	Total cases treated.	Remaining in Hospital at end of 1934.	Male.	Female.	Deaths.		
					Admissions.									
					Male.	Female.								
I.—Epidemic, Endemic, and Infectious Diseases.														
1. Enteric Group—														
(a) Typhoid Fever ... ..				...	16	1	5	17	1	...	...	...	...	...
(b) Paratyphoid A. ... ..				...	6	1	1	7	...	...	...	...	...	...
(c) Paratyphoid B. ... ..				...	...	...	...	...	...	...	...	...	...	...
(d) Type not defined ... ..				...	2	1	1	3	...	...	1	...	...	...
2. Typhus ... ..				...	...	...	...	...	...	...	...	...	...	...
3. Relapsing Fever ... ..				...	...	...	...	...	...	...	...	...	...	...
4. Undulant Fever ... ..				...	...	...	...	...	...	...	...	...	...	...
5. Malaria—														
Type undefined ... ..				...	...	17	...	17	...	...	156	...	...	...
(a) Tertian ... ..				...	1	...	...	1	...	4	1	...	...	...
(b) Quartan ... ..				...	...	...	...	...	...	...	...	...	...	...
(c) Aestivo-autumnal ... ..				24	1,776	346	40	2,146	31	23,204	9,922	11	...	...
(d) Cachexia ... ..				...	...	2	1	2	...	22	11	...	...	...
(e) Blackwater ... ..				...	13	4	3	17	1	3	...	...	...	...
6. Smallpox ... ..				...	327	144	98	471	2	203	42	...	...	...
Alastrim ... ..				1	9	3	...	13	...	2	1	...	...	...
7. Measles ... ..				1	39	25	1	65	...	157	87	26	...	...
8. Scarlet Fever ... ..				...	...	...	...	...	...	...	...	...	...	...
9. Whooping Cough ... ..				...	18	14	1	32	1	164	218	1	...	...
10. Diphtheria ... ..				...	...	...	...	...	...	...	...	...	...	...
11. Influenza ... ..				...	148	16	5	164	1	477	121	6	...	...
12. Miliary Fever ... ..				...	...	...	...	...	...	...	...	...	...	...
13. Mumps ... ..				3	18	9	...	30	...	258	96	...	...	...
14. Cholera ... ..				...	...	...	...	...	...	...	...	...	...	...
15. Epidemic diarrhoea ... ..				...	...	...	...	...	...	...	...	...	...	...
16. Dysentery—														
(a) Amœbic ... ..				10	666	169	92	845	31	1,489	600	...	...	...
(b) Bacillary ... ..				...	38	2	6	40	...	10	4	...	...	...
(c) Undefined or due to other causes ... ..				6	202	66	28	274	5	675	376	2	...	...
17. Plague—														
(a) Bubonic ... ..				...	...	...	...	...	...	...	...	...	...	...
(b) Pneumonic ... ..				...	...	...	...	...	...	...	...	...	...	...
(c) Septicæmic ... ..				...	...	...	...	...	...	...	...	...	...	...
(d) Undefined ... ..				...	...	...	...	...	...	...	...	...	...	...
18. Yellow Fever ... ..				...	...	...	...	...	...	...	...	...	...	...
19. Spirochætosis ictero-hæmorrhagica ... ..				...	...	...	...	...	...	...	...	...	...	...
20. Leprosy ... ..				66	290	24	23	380	180	1,748	745	...	...	...
21. Erysipelas ... ..				...	4	1	1	5	...	3	...	...	...	...
22. Acute Poliomyelitis ... ..				...	3	1	...	4	1	3	4	...	...	...
23. Encephalitis Lethargica ... ..				...	...	...	...	...	...	...	...	...	...	...
24. Epidemic Cerebro-spinal Fever ... ..				...	12	2	10	14	...	1	...	1	...	...
25. Other Epidemic Diseases—														
(a) Rubeola (German Measles) ... ..				1	6	1	...	8	...	5	1	...	...	...
(b) Varicella (Chicken-pox) ... ..				9	1,345	163	...	1,517	10	646	45	...	...	...
(c) Kala-azar ... ..				...	...	...	...	...	...	...	...	...	...	...
(d) Phlebotomus Fever ... ..				...	...	...	...	...	...	...	...	...	...	...
(e) Dengue ... ..				...	...	...	...	...	...	...	...	...	...	...
(f) Epidemic Dropsy ... ..				...	...	...	...	...	...	...	...	...	...	...
(g) Yaws ... ..				11	276	156	5	443	28	67,630	51,655	1	...	...
(h) Trypanosomiasis ... ..				268	1,175	373	108	1,816	201	1,764	1,033	...	...	...
Carried forward ... ..				400	6,390	1,541	429	8,331	493	98,468	65,119	48	...	...

TABLE V.—RETURN OF DISEASES AND DEATHS (NON-EUROPEAN)

FOR THE YEAR 1934—continued.

Diseases					IN-PATIENTS.					OUT-PATIENTS.				
					Remaining in Hospital at end of 1933.	TOTAL.		Deaths.	Total cases treated.	Remaining in Hospital at end of 1934.	Male.	Female.	Deaths	
						Admissions.								
						Male.	Female.							
Brought forward ... ..					400	6,390	1,541	429	8,331	493	98,468	65,119	48	
I.—Epidemic, Endemic, and Infectious Diseases—contd.														
26.	Glanders	...	...	...	...	...	...	...	...	...	...	...	...	...
27.	Anthrax	...	...	...	...	1	...	1	1	...	...	...	...	...
28.	Rabies	...	...	...	...	...	...	...	...	...	...	1	...	...
28a.	Anti Rabid Prophylaxis	...	...	...	3	19	3	...	25	...	42	9	...	...
29.	Tetanus	...	...	...	3	74	27	48	104	3	27	12	2	...
30.	Mycosis	...	...	...	4	13	1	1	18	...	26	15	...	...
31.	Tuberculosis, Pulmonary and Laryngeal	...	...	...	22	329	80	146	431	22	363	112	9	...
32.	Tuberculosis of the Meninges or Central Nervous System	...	...	...	...	1	1	...	2	...	5	4	...	...
33.	Tuberculosis of the Intestines or Peritoneum	...	...	...	3	12	4	10	19	...	8	...	2	...
34.	Tuberculosis of the Vertebral Column	...	...	...	6	37	14	3	57	8	30	10	...	...
35.	Tuberculosis of Bones and Joints	...	...	...	2	21	7	4	30	...	29	5	...	...
36.	Tuberculosis of other organs--													
	(a) Skin or Subcutaneous Tissue (Lupus)	...	...	...	...	5	2	...	7	...	2	7	...	...
	(b) Bones	...	...	...	...	8	2	...	10	1	3	4	...	...
	(c) Lymphatic System	...	...	...	3	30	7	3	40	1	45	31	1	...
	(d) Genito-urinary	...	...	...	...	3	...	...	3	...	1	...	...	...
	(e) Other Organs	...	...	...	2	22	5	3	29	1	11	2	1	...
37.	Tuberculosis disseminated--													
	(a) Acute	...	...	...	...	3	...	1	3	...	...	...	...	...
	(b) Chronic	...	...	...	...	4	4	8	8	...	1	1	...	...
38.	Syphilis--													
	(a) Primary	...	...	...	54	676	217	4	947	57	3,171	1,338	...	...
	(b) Secondary	...	...	...	71	646	411	4	1,128	52	2,231	1,219	...	...
	(c) Tertiary	...	...	...	22	202	97	30	321	27	1,476	818	1	...
	(d) Hereditary	...	...	...	6	30	19	11	55	...	48	51	4	...
	(e) Period not indicated	...	...	...	14	94	17	5	125	3	304	207	...	...
39.	Soft Chancre	...	...	...	18	177	12	...	207	12	1,209	60	...	...
40.	A.—Gonorrhœa and its complica- tions	...	...	...	35	800	179	8	1,014	47	12,768	2,781	...	...
	B.—Gonorrhœal Ophthalmia	...	...	...	2	56	17	1	75	1	158	70	...	...
	C.—Gonorrhœal Arthritis	...	...	...	18	193	23	4	234	10	734	62	...	...
	D.—Granuloma Venereum	...	...	...	6	25	6	1	37	1	35	6	...	...
41.	Septicæmia	...	...	...	...	39	11	28	50	...	3	6	...	...
	Filariosis	...	...	...	1	26	3	1	30	...	149	59	...	...
42.	Other Infectious Diseases	...	...	...	...	8	3	1	11	...	147	78	...	...
II.—General Diseases not mentioned above.														
43.	Cancer or other malignant Tumours of the Buccal Cavity	...	...	...	...	4	3	...	7	1	3	3	1	...
44.	Cancer or other malignant Tumours of the Stomach or Liver	...	...	...	1	23	6	15	30	...	10	2	1	...
45.	Cancer or other malignant Tumours of the Peritoneum intestines, Rectum	...	...	...	...	4	3	2	7	...	...	1	...	...
46.	Cancer or other malignant Tumours of the Female Genital Organs	...	...	...	...	...	23	3	23	...	...	12	2	...
47.	Cancer or other malignant Tumours of the Breast	...	...	...	...	3	11	...	14	...	...	7	...	...
48.	Cancer or other malignant Tumours of the Skin	...	...	...	1	28	12	2	41	4	25	10	...	...
Carried forward ... ..					697	10,006	2,771	777	13,474	744	121,532	72,122	72	...



TABLE V.—RETURN OF DISEASES AND DEATHS (NON-EUROPEAN)  
FOR THE YEAR 1934—*continued*.

Diseases.	IN-PATIENTS.						OUT-PATIENTS.		
	Remaining in Hospital at end of 1933.	TOTAL.			Total cases treated.	Remaining in Hospital at end of 1934.	Male.	Female.	Deaths
		Admissions.		Deaths.					
		Male.	Female.						
Brought forward ... ..	697	10,006	2,771	777	13,474	744	121,532	72,122	72
II.—General Diseases not mentioned above—contd.									
49. Cancer or other malignant Tumours of Organs not specified	1	45	12	12	58	1	20	12	...
50. Tumours non-Malignant ... ..	14	316	150	9	480	28	1,156	537	...
51. Acute Rheumatism ... ..	4	62	10	1	76	2	52	18	...
52. Chronic Rheumatism ... ..	17	411	112	8	540	19	21,044	9,163	1
53. Scurvy (including Barlow's Disease) ... ..	...	3	1	...	4	...	2	20	...
54. Pellagra ... ..	1	1	...	1	2	...	...	...	...
55. Beri-Beri ... ..	...	2	2	2	4	...	2	...	...
56. Rickets ... ..	...	2	1	1	3	...	15	8	...
57. Diabetes (not including Insipidus)	1	22	9	3	32	2	22	16	...
58. Anaemia:—									
(a) Pernicious ... ..	...	15	2	1	17	1	1	2	...
(b) Other Anaemias and Chloro- sis ... ..	6	164	50	21	220	11	1,483	1,211	...
59. Diseases of the Pituitary Body ...	...	...	...	...	...	...	...	...	...
60. Diseases of the Thyroid Gland ...	...	...	...	...	...	...	...	...	...
(a) Exophthalmic Goitre ... ..	...	2	10	2	12	...	19	17	...
(b) Other diseases of the Thy- roid Gland, Myxœdema ...	3	15	24	3	42	4	344	536	...
61. Diseases of the Para-Thyroid Glands ... ..	...	...	...	...	...	...	...	...	...
62. Diseases of the Thymus ... ..	...	...	...	...	...	...	...	...	...
63. Diseases of the Supra-Renal Glands ... ..	...	...	...	...	...	...	...	...	...
64. Diseases of the Spleen ... ..	4	67	21	4	92	9	1,480	997	...
65. Leukæmia:—									
(a) Leukæmia ... ..	...	4	...	...	4	1	4	5	...
(b) Hodgkin's Disease ... ..	...	6	...	...	6	...	6	4	...
66. Alcoholism ... ..	...	5	...	...	5	1	5	...	...
67. Chronic poisoning by mineral sub- stances (lead, mercury, &c.) ...	...	2	...	1	2	...	...	...	...
68. Chronic poisoning by organic sub- stances (Morphia, Cocaine, &c.) ...	...	...	...	...	...	...	...	...	...
69. Other General Diseases:—									
Auto-intoxication ... ..	...	3	1	1	4	...	1	1	...
Purpura Hæmorrhagica ... ..	...	...	...	...	...	...	...	2	...
Hæmophilia ... ..	...	...	...	...	...	...	...	...	...
Diabetes Insipidus ... ..	...	...	...	...	...	...	4	1	...
III.—Affections of the Nervous System and Organs of the Senses.									
70. Encephalitis (not including En- cephalitis Lethargica) ... ..	...	6	1	2	7	...	5	3	...
71. Meningitis (not including Tuber- culosis Meningitis or Cerebro- spinal Meningitis) ... ..	1	30	7	26	38	1	11	1	...
72. Locomotor Ataxia ... ..	2	5	...	...	7	...	4	...	...
73. Other affections of the Spinal Cord	3	12	2	3	17	...	13	1	...
Carried forward ... ..	754	14,206	3,186	878	15,146	824	147,225	84,677	73

TABLE V.—RETURN OF DISEASES AND DEATHS (NON-EUROPEAN)

FOR THE YEAR 1934—continued.

Diseases.	IN-PATIENTS.						OUT-PATIENTS.		
	Remaining in Hospital at end of 1933.	TOTAL.			Total Cases treated.	Remaining in Hospital at end of 1934.	Male.	Female.	Deaths
		Admissions.		Deaths.					
		Male.	Female.						
Brought forward ... ..	754	14,206	3,186	878	15,146	824	147,225	84,677	73
III.—Affections of the Nervous System and Organs of the Senses—contd.									
74. Apoplexy :—									
(a) Hæmorrhage ... ..	1	22	2	12	25	...	5	3	1
(b) Embolism ... ..	...	2	...	2	2	...	...	...	...
(c) Thrombosis ... ..	...	11	5	11	...	...	...	...	...
75. Paralysis :—									
(a) Hemiplegia ... ..	6	69	11	13	86	5	107	25	...
(b) Other Paralysis ... ..	22	109	24	9	155	10	135	59	...
76. General Paralysis of the Insane	...	2	1	...	3	...	5	...	...
77. Other forms of mental Alienation	150	82	25	22	257	3	78	31	...
78. Epilepsy ... ..	6	108	21	7	135	8	341	112	...
79. Eclampsia, Convulsions (nonpuer- peral) 5 years or over ... ..	...	2	5	2	7	...	8	4	...
80. Infantile Convulsions ... ..	...	22	23	11	45	3	57	46	...
81. Chorea ... ..	...	3	4	...	7	...	5	4	...
82. A.—Hysteria ... ..	...	11	9	...	20	1	16	14	...
B.—Neuritis ... ..	...	40	9	2	49	...	1,249	469	...
C.—Neurasthenia ... ..	2	13	6	1	21	...	239	84	...
83. Cerebral Softening ... ..	...	1	...	...	1	...	...	...	...
84. Other affections of the Nervous System, such as Paralysis Agitans ... ..	...	16	4	3	20	1	72	16	...
85. Affections of the Organs of Vision :—									
(a) Diseases of the eye ... ..	5	111	53	1	169	11	939	383	...
(b) Conjunctivitis ... ..	9	312	91	1	412	10	6,552	3,269	...
(c) Trachoma ... ..	2	12	10	...	24	...	75	54	...
(d) Tumours of the Eye ... ..	4	11	6	...	21	1	17	13	...
(e) Other affections of the Eye	5	195	69	1	269	16	1,593	733	...
86. Affections of the Ear or Mastoid Sinus ... ..	1	76	26	1	103	3	7,049	3,019	...
IV.—Affections of the Circulatory System.									
87. Pericarditis ... ..	...	15	1	6	16	...	14	5	...
88. Acute Endocarditis or Myocarditis	3	44	21	18	68	...	52	32	3
89. Angina Pectoris ... ..	...	...	...	...	...	...	...	...	...
90. Other Diseases of the Heart ... ..	...	...	...	...	...	...	...	...	...
(a) Valvular ... ..	...	3	...	...	3	1	43	34	1
Mitral ... ..	10	107	47	39	164	4	267	111	3
Aortic ... ..	...	35	14	18	49	1	42	17	2
Tricuspid ... ..	...	...	...	...	...	...	...	...	...
Pulmonary ... ..	...	...	...	...	...	...	...	...	...
(b) Myocarditis ... ..	3	93	23	30	119	4	333	149	3
91. Diseases of the Arteries :—									
(a) Aneurism ... ..	2	11	3	3	16	...	9	1	...
(b) Arterio-Sclerosis ... ..	1	1	2	1	4	...	19	6	...
(c) Other diseases ... ..	...	1	...	...	1	...	6	1	...
92. Embolism or Thrombosis (non- cerebral) ... ..	...	1	...	1	1	...	...	...	...
Carried forward ... ..	986	12,767	3,696	1,078	17,429	906	166,553	93,371	86



TABLE V.—RETURN OF DISEASES AND DEATHS (NON-EUROPEAN) FOR  
THE YEAR 1934—*continued*.

Diseases.	IN-PATIENTS.						OUT-PATIENTS.		
	Remaining in Hospital at end of 1933.	TOTAL.			Total cases treated.	Remaining in Hospital at end of 1934.	Male.	Female.	Deaths.
		Admissions.		Deaths.					
		Male.	Female.						
Brought forward ... ..	986	12,767	3,696	1,078	17,429	906	166,553	93,371	86
IV.— <i>Affections of the Circulatory System—contd.</i>									
93. Diseases of the Veins:—									
Hæmorrhoids ... ..	6	128	48	...	182	12	630	198	...
Varicose Veins .. ..	1	16	...	...	17	...	41	4	...
Phlebitis ... ..	...	13	2	1	15	...	7	...	...
94. Diseases of the Lymphatic System ... ..	...	...	...	...	...	...	7	...	...
Lymphangitis ... ..	...	21	3	...	24	...	105	27	...
Lymphadenitis, Bubo (non-specific) ... ..	31	603	80	8	714	30	2,738	713	...
95. Hæmorrhage of undetermined cause ... ..	...	4	7	...	11	...	16	15	...
96. Other affections of the Circulatory System ... ..	...	5	...	3	5	...	15	1	...
V.— <i>Affections of the Respiratory System.</i>									
97. Diseases of the Nasal Passages—	...	...	...	...	...	...	28	17	...
Adenoids ... ..	...	4	1	...	5	1	13	7	...
Polypus ... ..	1	4	6	...	11	...	15	13	...
Rhinitis ... ..	...	11	6	...	17	...	170	96	...
Coryza ... ..	...	26	2	...	28	...	2,985	1,376	...
98. Affections of the Larynx—									
Laryngitis ... ..	...	36	8	3	44	...	407	195	...
99. Bronchitis—									
(a) Acute ... ..	41	800	184	46	1,025	27	4,028	6,389	2
(b) Chronic ... ..	3	160	75	22	238	12	9,189	4,717	...
100. Broncho-Pneumonia ... ..	7	386	122	175	515	13	174	88	7
101. Pneumonia—									
(a) Lobar ... ..	44	900	166	282	1,110	23	284	59	2
(b) Unclassified ... ..	4	54	6	16	64	3	81	37	...
102. Pleurisy, Empyema ... ..	3	184	24	19	211	4	445	108	...
103. Congestion of the Lungs ... ..	...	8	...	...	8	...	10	2	...
104. Gangrene of the Lungs ... ..	...	2	...	2	2	...	...	...	...
105. Asthma ... ..	2	69	17	3	88	6	131	56	...
106. Pulmonary Emphysema ... ..	...	4	...	...	4	...	8	2	...
107. Other affections of the Lungs—									
Pulmonary Spirochætosis ... ..	...	9	...	...	9	...	28	3	...
VI.— <i>Diseases of the Digestive System.</i>									
108. A.—Diseases of Teeth or Gums—									
Caries, Pyorrhœa, &c. ... ..	3	43	14	3	60	1	5,017	2,123	...
B.—Other affections of the Mouth—									
Stomatitis ... ..	2	68	35	11	105	2	1,943	1,240	1
Glossitis, &c. ... ..	1	13	1	1	15	...	603	238	...
109. Affections of the Pharynx or Tonsils—									
Tonsillitis ... ..	2	82	27	2	111	2	1,225	629	...
Pharyngitis ... ..	...	20	7	1	27	...	708	287	...
Carried forward ... ..	1,137	16,420	4,537	1,676	22,094	1,042	197,604	112,011	98

TABLE V.—RETURN OF DISEASES AND DEATHS (NON-EUROPEAN) FOR  
THE YEAR 1934—*continued*.

Diseases.				IN-PATIENTS.					OUT-PATIENTS.				
				Remaining in Hospital at end of 1933.	TOTAL.		Deaths.	Total cases treated.	Remaining in Hospital at end of 1934.	Male.	Female.	Deaths	
					Admissions.								
					Male.	Female.							
Brought forward ...				1,137	16,420	4,537	1,676	22,094	1,042	197,604	112,011	98	
VI.—Diseases of the Digestive System—contd.													
110.	Affections of the Œsophagus ...			..	...	3	...	3	...	1	1	...	
111.	A.—Ulcer of the Stomach ...			..	2	1	2	3	...	24	6	...	
	B.—Ulcer of the Duodenum ...			2	38	5	4	45	2	111	2	1	
112.	Other affections of the Stomach—												
	Gastritis ... ..			3	129	30	6	162	4	1,966	1,107	1	
	Dyspepsia, &c. ... ..			5	152	42	1	199	3	4,603	2,553	...	
113.	Diarrhœa and Enteritis—												
	Under two years ... ..			1	55	56	17	112	6	1,458	1,018	2	
114.	Diarrhœa and Enteritis—												
	Two years and over ... ..			8	485	93	48	586	7	4,051	1,876	6	
	Colitis ... ..			2	102	13	7	117	3	747	287	1	
	Ulceration ... ..			...	4	1	2	5	...	1	2	...	
114a.	Sprue ... ..			...	...	...	...	...	...	...	...	...	
115.	Ankylostomiasis ... ..			10	556	219	21	785	18	1,362	715	...	
116.	Diseases due to Intestinal Parasites—												
	(a) Cestoda (Tænia) ... ..			1	145	23	2	169	...	6,766	1,796	...	
	(b) Trematoda (Flukes) ...			...	2	1	1	3	...	10	4	...	
	(c) Nematoda (other than Ankylostoma) ... ..			...	6	5	...	11	...	35	7	...	
	Ascaris ... ..			1	140	94	...	235	6	13,017	9,815	1	
	Trichocephalus dispar ...			...	3	...	1	3	...	21	16	...	
	Trichin ... ..			...	...	...	...	...	...	...	...	...	
	Dracunculus ... ..			13	505	37	...	555	5	1,672	290	...	
	Strongylus ... ..			...	1	1	...	2	...	3	1	...	
	Oxyuris ... ..			...	...	...	...	...	...	77	56	...	
	(d) Coccidia ... ..			...	...	...	...	...	...	...	...	...	
	(e) Other parasites ... ..			...	3	3	...	6	1	76	264	...	
	(f) Unclassified ... ..			...	...	...	...	...	...	14	4	...	
117.	Appendicitis ... ..			4	44	7	2	55	...	22	10	...	
118.	Hernia ... ..			128	2,278	150	78	2,556	123	1,948	129	...	
119.	A.—Affections of the Anus, Fistula, &c. ... ..			10	100	32	3	142	6	922	348	...	
	B.—Other affections of the Intestines ... ..			1	19	7	7	27	1	36	23	...	
	Enteroptosis ... ..			...	...	1	...	1	...	...	...	...	
	Constipation ... ..			2	116	49	1	167	2	23,252	8,273	...	
120.	Acute Yellow Atrophy of the Liver ... ..			...	1	...	1	1	...	...	...	...	
121.	Hydatid of the Liver ... ..			...	...	...	...	...	...	...	...	...	
122.	Cirrhosis of the Liver—												
	(a) Alcoholic ... ..			...	5	3	4	8	...	...	1	...	
	(b) Other forms ... ..			1	33	7	15	41	2	13	2	...	
123.	Biliary Calculus ... ..			...	3	1	...	4	...	1	1	...	
124.	Other affections of the Liver—			...	3	...	1	3	...	1	...	...	
	Abscess ... ..			...	50	9	11	59	3	19	7	...	
	Hepatitis ... ..			3	104	14	12	121	9	238	87	...	
	Cholecystitis ... ..			...	8	3	...	11	2	10	9	...	
	Jaundice ... ..			1	122	14	13	137	4	300	70	...	
Carried forward ... ..				1,333	21,634	5,461	1,936	28,428	1,249	260,381	140,791	110	



TABLE V.—RETURN OF DISEASES AND DEATHS (NON-EUROPEAN) FOR  
THE YEAR 1934—*continued*.

Diseases.				IN-PATIENTS.					OUT-PATIENTS.			
				Remaining in Hospital at end of 1933.	TOTAL.		Deaths.	Total cases treated.	Remaining in Hospital at end of 1934.	Male.	Female.	Deaths.
					Admissions.							
					Male.	Female.						
Brought forward	...	...	1,333	21,634	5,461	1,936	28,428	1,249	260,381	140,791	110	
VI.—Diseases of the Digestive System—contd.												
125.	Diseases of the Pancreas...	...	1	...	1	...	2	..	...	...	...	
126.	Peritonitis (cf unknown cause)	...	2	22	17	20	41	1	14	7	...	
127.	Other affections of the Digestive System	...	2	19	8	9	29	...	74	33	1	
VII.—Diseases of the Genito-urinary System (non-Venereal)												
128.	Acute Nephritis	...	11	143	38	50	192	8	147	64	...	
129.	Chronic	...	7	115	53	50	175	12	120	62	6	
130.	A.—Chyluria	...	...	8	...	...	8	1	...	1	...	
	B.—Schistosomiasis	...	8	140	19	7	167	11	409	49	1	
131.	Other affections of the Kidneys...	...	1	7	...	...	8	...	3	3	...	
	Pyelitis, &c.	...	...	23	10	6	33	2	20	14	...	
132.	Urinary Calculus	...	...	4	...	1	4	2	5	...	...	
133.	Diseases of the Bladder	...	4	2	1	1	7	...	19	14	...	
	Cystitis	...	...	125	59	19	184	14	570	258	...	
134.	Diseases of the Urethra—	...										
	(a) Stricture	...	24	385	2	21	411	17	582	7	...	
	(b) Other...	...	7	164	16	2	187	8	897	33	...	
135.	Diseases of the Prostate —	...										
	Hypertrophy	...	...	3	...	...	3	...	1	...	...	
	Prostatitis	...	...	8	...	...	8	...	49	...	...	
136.	Diseases (non-Venereal) of the Genital Organs of Man	...	41	243	...	1	284	13	333	...	...	
	Epididymitis	...	2	64	...	1	66	1	150	...	...	
	Orchitis	...	8	266	...	3	274	3	664	...	...	
	Hydrocele	...	31	568	...	7	599	28	544	...	...	
	Ulcer of Penis	...	4	157	...	...	161	6	1,101	...	...	
	Phimosis	...	1	244	...	...	245	3	1,361	...	...	
137.	Cysts or other non-malignant Tumours of the Ovaries	...	3	...	54	6	57	2	...	32	...	
138.	Salpingitis—	...	3	...	91	3	94	3	...	225	...	
	Abscess of the Pelvis	...	2	...	17	4	19	...	...	28	...	
139.	Uterine Tumours (non-malignant)	...	2	...	66	5	68	2	...	100	...	
140.	Uterine Hæmorrhage (non-puerperal)	...	...	...	25	...	25	...	...	101	...	
141.	A.—Metritis	...	3	...	143	2	146	1	...	508	...	
	B.—Other affections of the Female Genital Organs—	...										
	Displacements of Uterus	...	2	...	214	4	216	7	...	918	...	
	Amenorrhœa	...	1	...	23	...	24	2	...	554	...	
	Dysmenorrhœa	...	2	...	112	1	114	1	...	992	...	
	Leucorrhœa	...	1	...	47	...	48	1	...	346	...	
142.	Diseases of the Breast (non-puerperal) -	...	...	...	1	...	1	...	...	3	...	
	Mastitis	...	2	1	64	1	67	3	12	509	...	
	Abscess of Breast	...	3	3	23	...	29	1	4	55	...	
Carried forward				1,511	24,348	6,565	2,160	32,424	1,402	267,460	145,707	118

TABLE V.—RETURN OF DISEASES AND DEATHS (NON-EUROPEAN) FOR  
THE YEAR 1934—*continued*.

Diseases.						IN-PATIENTS.					OUT-PATIENTS.			
						Remaining in Hospital at end of 1933.	TOTAL.			Total cases treated.	Remaining in Hospital at end of 1934.	Male.	Female.	Deaths.
							Admissions.		Deaths.					
							Male.	Female.						
Brought forward ... ..						1,511	24,348	6,565	2,160	32,424	1,402	267,460	145,707	118
VIII.— <i>Puerperal State.</i>														
143.	A.—Normal Labour ... ..					5	...	1,040	11	1,045	15	...	539	...
	B.—Accidents of Pregnancy—													
	(a) Abortion ... ..					1	...	247	20	248	3	...	370	...
	(b) Ectopic Gestation ... ..					2	...	28	2	30	...	...	4	...
	(c) Other accidents of Preg- nancy... ..					2	...	157	13	159	4	...	409	...
144.	Puerperal Hæmorrhage ... ..					1	...	37	4	38	...	...	4	...
145.	Other accidents of Parturition ... ..					...	...	55	10	55	2	...	29	...
146.	Puerperal Septicæmia ... ..					...	...	28	10	28	2	...	19	...
147.	Phlegmasia Dolens... ..					...	...	...	...	...	...	...	2	...
148.	Puerperal Eclampsia ... ..					...	...	15	4	15	...	...	2	...
149.	Sequelæ of Labour ... ..					3	...	72	5	75	5	...	281	1
150.	Puerperal affections of the Breast					...	...	8	...	8	...	...	20	...
IX.— <i>Affections of the Skin and Cellular Tissues.</i>														
151.	Gangrene ... ..					5	71	26	21	102	6	96	13	...
152.	Boil ... ..					3	58	11	...	72	...	2,604	565	...
	Carbuncle ... ..					2	37	3	...	42	1	290	86	...
153.	Abscess ... ..					47	1,213	184	41	1,444	45	4,513	1,162	...
	Whitlow ... ..					5	157	34	...	196	8	1,771	709	...
	Cellulitis ... ..					40	738	116	30	894	26	4,104	1,184	1
154.	A.—Tinea ... ..					1	63	14	...	78	6	8,629	2,364	...
	B.—Scabies ... ..					5	84	27	...	116	5	17,994	5,706	...
155.	Other Diseases of the Skin					16	30	10	1	56	...	792	772	...
	Brythema... ..					1	6	3	...	10	...	201	64	...
	Urticaria ... ..					1	20	2	...	23	...	808	364	...
	Eczema ... ..					3	62	27	...	92	2	2,683	1,191	...
	Herpes ... ..					...	24	2	...	26	1	236	76	...
	Psoriasis ... ..					...	4	...	...	4	...	87	45	...
	Elephantiasis ... ..					29	380	41	7	450	37	386	90	...
	Ulcers ... ..					336	2,041	1,147	36	3,524	294	38,042	13,302	...
	Myiasis ... ..					...	...	...	...	...	...	4	4	...
	Chigoes ... ..					19	37	20	...	76	1	368	155	...
	Cutaneous Leishmaniasis					...	...	...	...	...	...	...	...	...
X.— <i>Diseases of bones and Organs of Locomotion (other than Tuber- culous).</i>														
156.	Diseases of Bones—													
	Osteitis ... ..					30	220	64	2	314	26	704	406	...
157.	Diseases of Joints—													
	Arthritis ... ..					19	344	75	5	438	11	3,294	1,321	...
	Synovitis ... ..					2	184	29	3	215	7	1,094	275	...
158.	Other Diseases of Bones or Organs of Locomotion ... ..					14	76	24	3	114	2	1,787	427	...
Carried forward ... ..						2,103	30,197	10,111	2,378	42,411	1,911	357,947	177,667	120



TABLE V.—RETURN OF DISEASES AND DEATHS (NON-EUROPEAN)  
FOR THE YEAR 1934—continued.

Diseases.				IN-PATIENTS.					OUT-PATIENTS.			
				Remaining in Hospital at end of 1933	TOTAL.			Total cases treated.	Remaining in Hospital at end of 1934.	Male.	Female.	Deaths
					Admissions.		Deaths.					
					Male.	Female.						
Brought forward ... ..				2,103	30,197	10,111	2,378	42,411	1,911	357,947	177,667	120
XI.—Malformations.												
159.	Malformations—											
	Hydrocephalus ... ..			2	3	3	...	8	...	8	5	...
	Hypospadias ... ..			...	9	...	1	9	...	6	...	...
	Spina Bifida, etc. ... ..			...	21	5	2	26	2	31	9	...
	Other Malformations ... ..			...	17	6	13	23	4	90	35	...
XII.—Diseases of Infancy.												
160.	Congenital Debility ... ..			4	45	41	35	90	15	132	133	...
161.	Premature Birth ... ..			...	9	11	5	20	...	12	14	..
162.	Other affections of infancy ... ..			2	74	83	36	159	8	663	936	4
163.	Infant neglect (infants of three months or over) ... ..			5	5	16	6	26	4	24	24	...
XIII.—Affections of Old Age.												
164.	Senility ... ..			1	12	7	6	20	1	49	40	3
	Senile Dementia ... ..			...	9	5	6	14	...	12	11	...
XIV.—Affections produced by External Causes.												
165.	Suicide by Poisoning ... ..			...	...	...	...	...	...	...	...	...
166.	Corrosive Poisoning (Intentional) ... ..			...	2	...	1	2	...	...	...	...
167.	Suicide by Gas Poisoning ... ..			...	...	...	...	...	...	...	...	...
168.	Suicide by Hanging or Strangulation ... ..			...	...	...	...	...	...	...	...	...
169.	Suicide by Drowning ... ..			...	...	...	...	...	...	...	...	...
170.	Suicide by Firearms ... ..			...	...	...	...	...	...	...	...	...
171.	Suicide by cutting or stabbing Instruments ... ..			...	2	...	2	2	...	1	...	...
172.	Suicide by jumping from a height ... ..			...	...	...	...	...	...	...	...	...
173.	Suicide by crushing ... ..			...	...	...	...	...	...	...	...	...
174.	Other Suicides ... ..			...	...	...	...	...	...	...	...	...
175.	Food Poisoning ... ..			...	11	9	5	20	...	9	8	...
	Botulism ... ..			...	...	...	...	...	...	...	...	...
176.	Attacks of poisonous animals ... ..			...	...	...	...	...	...	...	...	...
	Snake Bite .. ...			1	63	18	8	82	...	127	33	...
	Insect Bite ... ..			...	10	2	...	12	...	342	86	...
177.	Other accidental Poisonings ... ..			1	19	5	6	25	...	11	7	...
178.	Burns (by Fire) ... ..			8	151	74	28	233	16	1,433	677	1
179.	Burns (other than by Fire) ..			6	41	24	6	71	3	481	207	...
180.	Suffocation (accidental) ... ..			...	2	...	...	2	...	2	...	...
181.	Poisoning by Gas (accidental) ... ..			...	...	...	...	...	...	1	1	...
182.	Drowning (accidental) ... ..			...	9	...	2	9	...	4	...	..
183.	Wounds (by Firearms, war excepted) ... ..			3	129	6	21	138	5	57	1	...
184.	Wounds (by cutting or stabbing instruments) ... ..			67	805	131	38	1,003	42	7,799	1,487	...
185.	Wounds (by Fall) ... ..			6	298	52	15	356	7	4,768	899	...
186.	Wounds (in Mines or Quarries) ... ..			1	46	...	1	47	...	2,590	17	...
187.	Wounds (by Machinery) ... ..			2	38	3	1	43	...	204	35	...
Carried forward ... ..				2,212	32,027	10,612	2,632	44,851	2,018	376,803	182,332	128

TABLE V.—RETURN OF DISEASES AND DEATHS (NON-EUROPEAN)  
FOR THE YEAR 1934—continued.

Diseases.	IN-PATIENTS.						OUT-PATIENTS.		
	Remaining in Hospital at end of 1933.	TOTAL.			Total cases treated.	Remaining in Hospital at end of 1934.	Male.	Female.	Deaths.
		Admissions.		Deaths.					
		Male.	Female.						
Brought forward ... ..	2,212	32,027	10,612	2,632	44,851	2,018	376,803	182,332	128
XIV.—Affections produced by External Causes—contd.									
188. Wounds (crushing, e.g. railway accidents, etc.) ... ..	2	64	19	8	85	10	150	31	...
189. Injuries inflicted by Animals, Bites, Kicks, etc. ... ..	1	80	16	4	97	4	1,022	371	...
190. Wounds inflicted on Active Service ... ..	...	...	...	...	...	...	...	...	...
191. Executions of civilians by belligerents ... ..	...	...	...	...	...	...	...	...	...
192. A.—Over fatigue ... ..	...	2	...	...	2	...	3	...	...
B.—Hunger or Thirst ... ..	...	16	5	11	21	...	3	2	...
193. Exposure to Cold, Frost bite, etc. ... ..	...	...	...	...	...	...	55	6	...
194. Exposure to Heat—									
Heatstroke ... ..	...	2	...	...	2	...	1	...	...
Sunstroke ... ..	...	...	...	...	...	...	...	...	...
195. Lightning Stroke ... ..	...	2	1	...	3	...	...	...	...
196. Electric Shock ... ..	...	2	...	...	2	...	2	...	...
197. Murder by Firearms ... ..	...	...	...	...	...	...	...	...	...
198. Murder by cutting or stabbing instruments ... ..	...	1	1	2	2	...	...	...	...
199. Murder by other means ... ..	...	...	...	...	...	...	...	...	...
200. Infanticide (Murder of an infant under one year) ... ..	...	...	...	...	...	...	...	...	...
201. A.—Dislocation ... ..	2	50	12	...	64	5	131	30	...
B.—Sprain ... ..	3	142	9	...	154	8	2,467	313	...
C.—Fracture ... ..	60	538	128	61	726	47	473	135	...
202. Other External Injuries ... ..	35	1,070	222	22	1,327	55	23,225	3,890	...
203. Deaths by Violence of unknown cause ... ..	...	10	1	...	11	...	...	...	...
XV.—Ill-Defined Diseases.									
204. Sudden Death (cause unknown) ... ..	...	2	2	4	4	...	...	...	...
205. A.—Diseases not already specified or ill-defined—									
Ascites ... ..	14	151	70	47	235	23	174	61	...
Œdema ... ..	1	47	15	7	63	...	179	81	...
Asthenia ... ..	15	115	32	24	162	8	1,065	835	1
Shock ... ..	...	9	3	2	12	...	1	2	...
Hyperpyrexia ... ..	...	20	4	1	24	...	62	6	...
B.—Malingering ... ..	9	47	15	...	71	...	269	40	...
Pyrexia of uncertain origin ... ..	...	9	...	...	9	...	...	...	...
XVI.—Diseases the total of which have not caused 10 Deaths.									
Ainhum ... ..	...	15	3	...	18	1	92	15	...
Gangosa ... ..	...	...	2	2	2	...	6	3	...
Avitamiasis ... ..	...	...	...	...	...	...	159	60	...
Total ... ..	2,354	34,421	11,172	2,827	47,947	2,179	406,342	188,213	129
Ante Natal Cases ... ..	2	2	152	...	156	6	304	4,864	9



# APPENDICES.





## APPENDIX A.

---

### Report of the Laboratory Service.

#### PATHOLOGICAL UNIT.

The following subjects received attention during the year:—  
Sickle-cell anæmia—malignant tumours among natives of Nigeria—  
Schick tests in Africans—Hodgkin's disease in Africans.

Sporadic cases of sickle-cell anæmia continued to occur, the condition frequently remaining unsuspected until brought to light at autopsy when death has occurred from a terminal complication, usually some form of pneumonia.

A sickle-cell survey among Nigerian natives would be interesting in order to gain some idea of the percentage of natives with the 'sickle-cell trait' even though they may not necessarily display any symptoms of the condition. The investigation of malignant disease among natives was continued, 500 tumours being examined in all. It would appear that carcinoma and sarcoma are of relatively equal frequency, that malignant tumours of the skin are common and that the distribution and age incidence of tumours show some striking variations from that found among Europeans. With the assistance of the Medical Officer of Health, Lagos, a series of 1,750 Schick tests have been carried out in natives. The reactions were surprisingly easy to read and it was found that approximately thirty per cent of those examined during the first year of life were Schick positive. For ages up to ten years approximately twenty per cent are susceptible and from that onward almost complete immunity seems to prevail. Since clinical diphtheria is almost unknown in Nigeria it seems reasonable to assume that natural immunisation by subclinical infection is responsible for the high rate of immunes. Material from cases of Hodgkin's disease has been investigated as opportunity arose and the Gordon biological test has been found to be of value in the diagnosis of doubtful cases.

2. The following is a summary of the work performed in the Laboratory at Lagos:—

*Rabies.*—During the year ninety-four brains were received, eighty-four dogs, nine cats and one human.

Of these forty-one were positive (thirty-nine dogs and two cats).

It is interesting to note that one dog's brain was negative on histological examination but proved positive on animal inoculation.

The positive brains came from the following districts:—

Aba, 1; Abakaliki, 2; Abeokuta, 4; Bamenda, 4 (1 cat); Calabar, 1; Ikot-Ekpene, 1; Lagos, 26 (1 cat); Mamfe, 1; Obubra, 1.

*Tumours.*—One hundred and eighteen specimens of tumour tissue were examined during the year. Forty of these were benign and seventy-eight malignant.

Of the malignant tumours fifty-two were carcinomata and twenty-six sarcomata.

The regional distribution of the malignant tumours was as follows :—

					Carcinoma.	Sarcoma.
Alimentary tract	...	...	...	...	3	—
Bones and joints	...	...	...	...	1 (secondary)	3
Breast	...	...	...	...	5	1
Female genitals	...	...	...	...	11	—
Kidney	...	...	...	...	1	—
Liver	...	...	...	...	11 (primary)	—
Lymph gland	...	...	...	...	3 (secondary)	4
Orbit	...	...	...	...	2	4
Prostate	...	...	...	...	1	—
Salivary glands	...	...	...	...	2	—
Skin and subcutaneous tissues	...	...	...	...	10	14
Thyroid	...	...	...	...	1	—
Unknown	...	...	...	...	1	—

*Miscellaneous histological examinations.*—405 specimens were examined and reported upon during the year.

*Post-mortem work.*—During the year 298 autopsies were performed, an increase of 112 over last year. Of the total, ninety-five were Coroner's, eighty-six were Health and the remainder hospital cases. The number given above does not represent the total number of autopsies performed in Lagos as the Health Officers kindly assist with Coroner's and Health cases.

The following is a summary of the post-mortem examinations made by the Pathological Unit :—

Accidents, 19 (burns 2, trauma 6, lacerated spleen 2, drowning 7, electrocution 1, cut throat 1); atheroma, 11; anæmia, 5 (3 sickle-cell); aneurysm, 6; amoebic dysentery, 5 (1 liver abscess); ankylostomiasis, 2; broncho-pneumonia, 85 (with abdomen syndrome 16, hæmorrhagic 5); bacillary dysentery, 6 (2 flexner); brain softening, 1; cirrhosis of liver, 4; diabetes mellitus, 1; exposure and starvation, 1; empyema, 1; fatty degeneration of heart, 7; gastro-enteritis, 3; gastric hæmorrhage, 1; Icterus neonatorum, 1; malignant disease, 10 (liver 5, œsophagus 1, abdomen 3, kidney 1); meningitis, 2; marasmus, 2; nephritis, 22; œdema glottis, 1; pneumonia (lobar), 13; pleurisy, 2; perforated gastric ulcer, 1; perforated duodenal ulcer, 1; pyæmia, 4; pericarditis, 1; peritonitis, 8; pemphigus, 1; Tuberculosis, 52 (generalised 16, glandular 5, Pott's disease 1, pulmonary 23, miliary 3, peritoneal 3, menigeal 1); typhoid, 1; tartar emetic poisoning, 1; strangulated volvulus, 1; strangulated hernia, 1; septicæmia, 9; unknown, 14 (decomposed 6).

A summary of other examination made during the year is attached.

It is hoped to undertake more biochemical tests in the future. Dr. M. Ellis gave valuable instruction to the Laboratory Attendants in the technique of gastric analysis during the time he was attached to the hospital. Eighteen analyses of stomach contents are recorded.



## PUBLICATIONS.

- (1) Post-mortem report on a case of sickle-cell anæmia.—*Trans. Roy. Soc. Trop. Med.*, Vol. XXVIII.
- (2) Filtration experiments with *Spirochæta schaudinnii*.—*Jour. of Hygiene*, Vol. XXXIV.
- (3) An analysis of 1758 Schick tests in Nigerian natives (In collaboration with the Medical Officer of Health) *Lancet*, Vol. II, XXV.
- (4) Malignant disease in natives of Nigeria. An analysis of 500 tumours. *Annals of Tropical Medical and Parasitology*, Vol. XXVIII.

## MEDICAL LABORATORY SERVICE, NIGERIA.

## YEARLY REPORT.

Blood Examinations.	No. of Examinations.	Subtertian.	Crescents.	Quartan.	Benign tertian.	Trypanosomes.	Microfilariae.	Spironemata.	Total R.B.C.	Total W.B.C.	Differential W.B.C.
European male ...	374	47	...	1	...	...	5	...	4	4	16
„ female...	128	12	...	1	...	...	...	...	1	1	1
Total ...	502	59	...	2	...	...	5	...	5	5	17
African male ...	3,281	556	13	26	...	...	153	...	63	67	70
„ female ...	1,285	423	13	23	...	...	21	...	22	26	23
Total ...	4,566	979	26	49	...	...	174	...	85	93	93
Total ...	5,068	1,038	26	51	...	...	179	...	90	98	110

Stool Examinations.	No. of Examinations.	T. saginata.	Ascaris.	Ancylostome.	T. trichiura.	Strongyloides.	Flagellates.	E. histolytica.		E. coli.		S. mansoni.	Blood.	Mucus.	Cellular exudate.	Other protozoa.
								Free.	Encysted.	Free.	Encysted.					
European male ...	248	...	13	3	12	1	8	1	1	2	13	...	20	62	30	8
„ female	80	...	4	2	4	...	...	3	...	...	1	...	6	26	13	3
Total ...	328	...	17	5	16	1	8	4	1	2	14	...	26	88	43	11
African male ...	3,272	12	1,941	1,297	1,950	150	293	21	5	30	314	14	138	216	168	27
„ female...	962	1	780	386	619	44	60	5	1	11	96	...	43	85	57	10
Total ...	4,234	13	2,721	1,683	2,569	194	353	26	6	41	410	14	181	301	225	37
Total ...	4,562	13	2,738	1,688	2,585	195	361	30	7	43	424	14	207	389	268	48

One case of balantidial dysentery in a prisoner from the Lagos Prison.

Urine Examinations.		No. of Examinations.	Albumen.	Sugar.	Phosphates.	Casts.	Pus.	Blood.	S. hæmatobium.	Bile salts.	Bile pigments.	Acetone.	Di-acetic acid.
European male	...	29	21	...	1	2	21	8	...	...	...	...	...
„ female	...	17	14	...	2	1	13	5	...	...	...	...	...
Total	...	46	35	...	3	3	34	13	...	...	...	...	...
African male	...	2,586	1,634	16	505	80	1,552	273	134	11	6	7	...
„ female	...	653	480	8	79	20	430	78	39	2	2	2	...
Total	...	3,239	2,114	24	584	100	1,982	351	173	13	8	9	...
Total ...	...	3,285	2,149	24	587	103	2,016	364	173	13	8	9	...

Sputum Examinations.			No. of Examinations.	Tubercle bacilli.	P. pestis.	Spironemata.	Remarks :
European male	...	...	10	3	...	...	
„ female	...	...	1	...	...	...	
African male	...	...	533	112	...	...	
„ female	...	...	104	40	...	...	

#### PUS SMEARS FOR GONOCOCCI.

				No. of Examinations.	Positive.
European Male	...	...	...	62	19
„ Female	...	...	...	1	0
Total	...	...	...	63	19
African Male	...	...	...	122	54
„ Female	...	...	...	113	38
Total	...	...	...	235	92
Total	...	...	...	298	111

*Miscellaneous examinations for organisms.*—Ninety-one specimens were examined including eight for mycobacterium lepræ. Of the latter, four were positive.



## APPENDIX B.

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### Report of the Tsetse Investigation.

By H. M. O. LESTER, B.Sc., M.R.C.S.,  
*Deputy Director, Tsetse Investigation.*

The pressing need for expansion of the sleeping sickness service has necessitated a reorganisation of the Tsetse investigation. The chief changes have been the move of the headquarters office from Gadau to Kaduna, the abolition of the posts of Senior Sleeping Sickness Officer and of Assistant Veterinary Pathologist, the curtailment of cattle research and the closing down of the power plant at Gadau. The diminution of the research side of the investigation's activities will make more funds available for sleeping sickness work in the field and for the equipment of sleeping sickness dispensaries.

The sleeping sickness service is now concerned with nearly every province in the North and lately has had to work in the Eastern Provinces and in the Cameroons. The closest co-operation between the Tsetse Investigation staff and the Administrative service is essential in that all preventative measures entail the administrative control of the population. Although, owing to the nature of the surrounding country, Gadau is an excellent site for a research station, its inaccessibility has made co-ordination of the various field activities and co-operation with the administration increasingly difficult. For this reason the headquarters office was moved to Kaduna in October. The change is making the direction of the sleeping sickness side of the work very much easier.

The Senior Sleeping Sickness Officer, Dr. J. C. Paisley, was invalided in May and has since retired from the West African Medical Staff. Although his services will be greatly missed his post is not to be filled. Instead a Sleeping Sickness Officer is to be appointed. He will be stationed at Gadau to run the sleeping sickness clinic and to inspect the dispensaries which have been established in the neighbourhood and will have few administrative duties except during the leave of the Deputy Director. The Assistant Veterinary Pathologist, Mr. R. S. Marshall reverted to the Veterinary Department in November. The need for saving money by closing down the power plant and cutting down the amount of animal research done at Gadau meant that his activities there would have been very restricted. The Assistant Veterinary Pathologist has done most useful work and it is hoped that as soon as the need for economy is less urgent this appointment will be filled again.

The European staff of the Investigation is to consist of the Deputy Director at Kaduna, the Sleeping Sickness Officer, the Entomologist and the Technical Assistant at Gadau and six Sleeping Sickness Medical Officers in the field. The six Medical Officers are attached temporarily for this work and usually do not remain with the Investigation longer than one tour of service. Although the Technical Assistant is the only European Officer whose duties are concerned solely with research a large part of the programme is still being carried out. This is being done by the African staff under the immediate supervision of the Technical Assistant as directed from Kaduna. The Entomological research is being carried on as before. It is noteworthy that the expenditure on research only amounts now to about six per cent of the total, the remainder being spent on sleeping sickness work.



During the year two scientific papers have been published.

- (1) "The Effect of High Maximum Temperature upon the Longevity of *Glossina Submorsitans* Newst., and *Glossina Tachinoides*, Westw." by Dr. T. A. M. Nash.
- (2) "Some Experience with Potassium Antimonyl Tartrate in the Treatment of Bovine Trypanosomiasis in Nigeria" by R. S. Marshall, H. M. O. Lester and A. G. F. Jones.

## RESEARCH WORK.

### (1) THE TESTING OF NEW CHEMICAL COMPOUNDS.

We are indebted to Messrs. Bayer Meister Lucius for trial quantities of a further series of new chemical compounds. The trypanocidal properties of these are under test. The experiments started in 1933 with Surfen C and with Sdt. 386B have been continued and have yielded interesting results. In addition work has been done with preparations 6210 and 6558 which are of a character similar to Surfen C and like that compound contain no metal, and with preparations 5547, 6690 and 7217 which are arsenic and antimony compounds. Some work too has been done with a new compound S. 107 sent to us by Professor Warrington Yorke. S. 107 is a complex aromatic arsenical compound prepared by Professor Morgan under the auspices of the Chemotherapy Committee of the Medical Research Council. The drug has been tried on neuro-syphilitics in England and was sent out to Nigeria for trial as a remedy against sleeping sickness.

*Surfen C*.—Although this drug is unlikely to be of much value in the treatment of man owing to its destructive action on the sleeping sickness kidney the testing of its trypanocidal action in small laboratory animals, sheep and cattle has been continued. In mice Surfen C is effective against *T. brucei* and against strains isolated from man. For example with one strain of *T. brucei* a dose of .1 gramme per kilogram was sufficient to cure eight out of twelve infected mice the remainder relapsing in two to three weeks. A similar dose cured nearly 100% of mice infected with local *T. congolense* strains. With sheep infected with strains of *T. vivax* and *T. congolense* a dose of 10 mg. per kilogram which is that recommended by the makers proved to be more effective than a standard dose of tartar emetic. However even three doses of Surfen C given at weekly intervals did not prevent relapse.

*Cattle Experiment*.—Twelve clean cattle were infected with a virulent double infection of *T. vivax* and *T. congolense* by feeding about 150 wild *G. submorsitans* on them. Five animals were kept as controls the remainder were treated with a single dose of Surfen C, 10 mg. per kilogram bodyweight. Six were given the drug by the intramuscular route; the remaining animal was given its dose by intravenous injection and died almost immediately. Out of the six animals treated by the single intramuscular injection one relapsed a week afterwards and died two days later. The other five animals were alive and in reasonably good condition four months later when an outbreak of rinderpest complicated the experiment. All of them relapsed about five weeks after treatment. Occasional scanty trypanosomes showed up in the blood, but this chronic infection did not seem to interfere with the general health of the animals. The five untreated controls all died in short time, four of them within two to five weeks of the time the infected tsetse were allowed to feed on them.



The results of single intramuscular injections of Surfen C seemed to be so good that it was decided to supplement these observations by experiments to compare the action of one dose of Surfen C with that of a course of three injections given at weekly intervals and with a course of three weekly injections of tartar emetic on groups of cattle infected with pure *T. vivax*, *T. congolense* and a mixed infection of *T. vivax* and *T. congolense*. Some thirty animals were allocated to each experiment. Of these six were given three weekly doses of Surfen C, 10 mg. per kilogram bodyweight, twelve were given single doses of the drug, six were given the routine course of tartar emetic, the three doses of .06-.08 of a 4% solution per kilogram bodyweight, and six were left untreated as controls.

The outbreak of rinderpest complicated the experiments as within a period of twenty days thirty-one out of the ninety animals used contracted this disease and died. The remaining animals either had rinderpest before or had been rendered immune by double inoculation and so were unaffected. The loss of a third of the cattle made some of the groups rather small. When the three experiments are combined into one table the following results are obtained. It will be understood that all the rinderpest animals have been excluded from the table which shows the numbers alive at different periods.

			No. given 3 dose Surfen C.	No. given 1 dose Surfen C.	No. given 3 dose tartar emetic.	Controls.
At treatment	...	...	9	23	11	16
After 3 months	...	...	9	22	7	5
After 6 months	...	...	9	13	6	1

From the point of view of a definite cure the results were not good as the majority of animals relapsed within a few weeks. Only 18.2% of animals treated with three doses of Surfen C were cured, *i.e.*, failed to relapse within six months while cures with one dose of Surfen C and three doses of tartar emetic were 3.0% and 3.6% respectively. These findings differ from those of Hornby who, working in Tanganyika in 1933 reported that the majority of *T. congolense* cattle he treated with one dose of Surfen C did not relapse. Probably differences in the character of the East and West African strains account for this. In spite of the fact that trypanosomes returned to the blood stream within a few weeks treatment with three doses of Surfen C seemed effective in that 100% of the animals were alive after six months whereas only 6.2% of the controls survived the same period. Up to the present a three dose course of Surfen C has given better results against local trypanosome strains than any we have had with tartar emetic.

A single dose of Surfen C appears to be effective up to three or four months. In both the *T. congolense* and the mixed infection experiments the animals went down hill later and after six to seven months about half of them were dead. The later results against the particular strain of *T. vivax* used were rather better than this. It appears then that whereas the effects of a single dose of Surfen C are comparable with those of a three-dose course of a tartar emetic a three-dose course of Surfen C is a good deal more effective.

*Preparation Sdt. 386B.*—In mice infected with *T. brucei* Sdt. 386B, which is an organic compound containing both arsenic antimony in combination had much the same action as Surfen C. It was fairly effective against strains isolated from man though less so than Surfen C.



Against *T. congolense* in mice the trypanocidal action was not good. A dose of .05 grammes per kilogram sufficed to clear the blood of trypanosomes within twenty-four hours but eighty per cent relapsed within a week. The drug appears to have little action on *T. vivax* in sheep, a dose of 10 mg. per kilogram only causing a temporary disappearance of trypanosomes from the blood. In view of these findings we do not think that Sdt. 386B is a likely remedy against Nigerian strains of *T. vivax* and *T. congolense*.

Some preliminary tests have been carried out in man. The initial dose was .1 gram, and this was followed by .15 grams, 2 grams, 25 grams, and .3 grams doses at weekly intervals, the total dosage being 1.75 grams. With four late cases the results were not good. The patients continued to go down hill and so treatment was stopped and the patients given a course of tryparsamide. Earlier cases reacted better. In a series of eleven patients, blood and gland juice examination were made after every third injection and lumbar punctures were done before and at the end of the course of treatment. The results were as follows:

*Cases 1 and 2* diagnosed by finding trypanosomes in thick blood films. Trypanosomes finally disappeared from the blood after the third injection—patients improved very rapidly clinically and seemed quite well at the end of treatment. The cerebrospinal fluid was normal both before and after treatment.

*Cases 3 and 4* were similar to the above except for the fact that trypanosomes did not disappear from the blood until after the sixth injection.

*Case 5.*—Both blood and gland juice were negative after the third injection. Clinically the patient improved very rapidly. At the start of treatment the cell count in the C.S.F. was 188 it had fallen to six at the end of treatment.

*Case 6.*—The gland juice was negative after the third injection. However the patient failed to respond clinically. At the start the C.S.F. cell count was 162 and at the finish it was still 105.

*Case 7.*—Both gland juice and blood did not become negative until after the sixth injection. The patient showed slight improvement clinically. The C.S.F. cell count was 295 at the start and 197 at the end.

*Cases 8 and 9.*—Both blood and gland juices were negative after the third injection. Both patients improved fairly quickly clinically. Their C.S.F. cell counts fell from 24-15 and from 45-17 respectively.

*Case 10.*—The gland juice was positive after the third injection but negative after the sixth. The patient showed good clinical improvement and the C.S.F. cell count fell from 102-27.

*Case 11.*—The gland juice was positive after the sixth injection but negative at the end of treatment. The patient showed some clinical improvement but was still far from well. The C.S.F. cell count fell from 394-143.

Taken as a whole these cases indicated that although Sdt. 386B was active against Nigerian Sleeping Sickness it was not as effective as a course of Bayer 205 would have been. Further experiments are to be carried out. At the suggestion of the German firm larger doses are to be tried and also the effect of a combined treatment with this drug and Bayer 205.

*Preparation 6210.*—In mice it had much the same trypanocidal action on *T. brucei*, strains isolated from man and *T. congolense* as had Surfen C. In *T. vivax* and *T. congolense* infection of sheep a



single dose of 10 mg. per kilogram sufficed to clear all trypanosomes from the blood in one to two days but they re-appeared in one to four weeks. The drug was possibly a little more effective against the *T. vivax* strain used than against the *T. congolense*.

*Preparation 6858.*—In mice this compound had an action on *T. brucei* similar to those of Surfen C and Preparation 6210. It was less trypanocidal than they were to strains isolated from man and to *T. congolense*. In the case of *T. vivax* in sheep it appeared little less active than Surfen C.

*Preparation 6690.*—In mice the drug had a good effect on *T. brucei* strains and on strains isolated from man its action being very similar to that of Surfen C. Against laboratory strains of *T. congolense* in mice it was not so active as Surfen C and it had only a transitory action on *T. vivax* in sheep.

*Preparation 7217.*—In mice preparation 7217 had only a slight trypanocidal action on *T. brucei*, *T. congolense* and strains isolated from man. Messrs. Bayer Meister Lucius inform us that they have found it to be particularly effective against *T. brucei* strains resistant to salvarsan. Its trypanocidal action on strains showing abnormal resistant to tryparsamide is under test. If the results are good it is possible that this preparation might be useful for the treatment of human cases resistant to tryparsamide.

*Preparation 5547.*—This substance has to be given as a suspension in oil by intramuscular injection. Extensive tests with it have not been made yet.

It was active against *T. brucei* in guinea-pigs but in doses of 10 mg. per kilogram it had no action at all on a strain of *T. vivax* in sheep.

*Compound S. 107* (British Research Council).—In some preliminary tests patients were given an initial dose of 1 gramme and subsequent doses of 2 grammes at five to seven-day intervals, the total dosage being 25-30 grammes. The gland juice and blood were examined after every third injection. C.S.F. cell counts were done at the start and at the finish of treatment. The stimulant action of a long course of treatment with this drug, an arsenical compound, was very pronounced and led to the same difficulty commonly met with in experimental work with tryparsamide. Patients felt so much better that they became tired of the prolonged treatment and absconded before they had completed their course of injections. Eight cases have been treated with S.107 but five of these absconded before the final examination of the C.S.F. could be done. In every case, patients showed very rapid clinical improvement and thought themselves completely cured after they had had five or six injections. In one case trypanosomes could still be detected in the blood after the ninth injection but disappeared later. In two other cases trypanosomes persisted after the sixth but had disappeared by the ninth injection. In two of the cases that completed the full course of treatment the C.S.F. cell counts fell from 332-1 and from 238-39 respectively in the third there was increased cell count at the time of the final examination. Taken as a whole results were distinctly promising. No late cases were included in the series but it is noteworthy that one very advanced case that had failed to react to full courses of tryparsamide, of Bayer 205 and of Antrypol, for some reason or another improved markedly on being given a course of this new drug. At the suggestion of Professor Warrington Yorke who informs us that S.107 is less toxic than tryparsamide these observations are being extended; patients are being given initial doses of 1.5 grams. and subsequent doses of 3 grammes.



## (2) THE EFFECT OF EXPOSING "PREMUNISED" ANIMALS TO FRESH INFECTIONS.

The writer's experience is that the infection rate in wild *G. submorsitans* is so high that local Fulani cattle are incapable of withstanding constant attack by this species of tsetse. If an animal has recovered either naturally or through treatment it may have increased resistance to the strain with which it infected previously but there seems little likelihood of it being resistant to massive infection with large numbers of different strains *G. submorsitans* in Nigeria being a game tsetse is almost always heavily infected, rates of thirty to sixty per cent being common. An animal bitten by a hundred or so wild *G. submorsitans* is likely to be infected with several mixed strains of both *T. vivax* and *T. congolense*. With clean cattle the resultant infection is usually a virulent one, the disease taking a rapid course and the majority of animals dying within six weeks.

In order to investigate the effect of exposing premunised cattle to the attack of wild *G. submorsitans* it was decided to utilise the survivors from the various mixed infection treatment experiments and keep them for two weeks in an area known to be heavily infested with this tsetse. Some nine animals were available. Six of them had been exposed to infection with *T. vivax* and *T. congolense* in the dry season of 1931-32. Five of these had been treated with tartar emetic and the sixth was the one untreated control which had survived. The other beasts had all been given a double infection during the dry season 1932-33 and had been treated with tartar emetic. During the wet season of 1934 scanty trypanosomes had occasionally been seen in the blood of the majority of the animals. In five examinations made during the month before the start of the experiment eight of the animals were negative scanty trypanosomes being seen once in the blood of one animal. Five of them were in very good condition four were rather thin. The weights varied from 291-413 kilograms.

Every day for a fortnight these cattle were allowed to graze in a *G. submorsitans* area situated about five miles from the station. Within a month after their first exposure to tsetse three out of the nine animals had died. All the survivors had lost condition their average loss in weight for the month being 28.7 kilos. Trypanosomes showed up scantily in the blood from time to time, but at no time were they numerous. In the following month three more animals died while the three survivors had suffered a still further loss of condition the average loss of weight for the month being 39.0 kilograms. Up to the time of writing two months after the first exposure to *G. morsitans* six out of nine "premunised" cattle have died. It is noteworthy that the three survivors were those which were in the best condition and were the heaviest of the series, all three having weights in the neighbourhood of 400 kilos at the start. The way all the cattle went down hill without trypanosomes ever becoming at all numerous in the blood was interesting. Evidently their state of premunition was sufficient to modify the infection though not to prevent the mortality.

As a comparative experiment animals which had previously been infected with *T. vivax* were given a dose of pure *T. vivax* by direct passage. In all thirty-three cattle were used. Of these sixteen had contracted *T. vivax* at the end of the wet season in 1932 and had been treated with tartar emetic. Seven were the survivors of a control group which had been infected at the same time but had been left untreated. The remaining ten were clean animals purchased to serve as controls. During the month prior to examination blood films were examined daily. In nine out of the twenty-three old *T. vivax* animals scanty trypanosomes were occasionally seen: the remaining fourteen were invariably negative.



No trypanosomes could be detected in any of the clean cattle in the control group. All animals were given a dose of blood containing about a million *T. vivax*. Whereas all the clean control animals showed up within eleven days, the infection being of the usual type with trypanosomes frequently very numerous in the blood, there is as yet no evidence that this inoculation produced any effect whatsoever on the premunised animals. Up to the time of writing, a month after inoculation, only five out of the twenty-three animals have shown scanty infections in the blood. Four of these were animals in which trypanosomes were detected the preceding month, the other, which showed up a scanty infection on one day only, being one which had been negative before. All the cattle are being kept under observation. It is too early yet to draw any definite conclusions but later it should be possible to determine what effect if any, the injection of a dose of *T. vivax* has had on cattle which had been infected with this trypanosome two years previously.

### (3) RESISTANCE TO TRYPARSAMIDE.

In the 1931 report mention was made of the fact that, although an attempt to make a strain isolated from man resistant to tryparsamide by subjecting it to numerous doses of the drug in guinea-pigs had been successful on one occasion, it was not possible to discover whether this acquired resistance was kept during cyclical transmission as the strain seemed to have lost completely its transmissibility. For the last three years various strains, originally sensitive to tryparsamide have been maintained in guinea-pigs which have been given increasing doses of this drug. Literally many hundreds of injections have been given and yet the strains are not yet completely insensitive to a dose of 4 grams of tryparsamide per kilogram bodyweight. Quite often, trypanosomes in an individual animal appear to be resistant to this dose but on passing on the strain by direct transmission to other guinea-pigs the resistance invariably seems to be diminished. Duke has recorded similar observations. He rightly points out that because the subjection of a strain to a few doses of a drug in mice, animals which have little natural resistance to trypanosomiasis, enhances its drug resistance, it does not follow that similar exposure of the strain to the drug in a species of animals which has a high natural resistance to trypanosomiasis would produce similar results. The fact that it is so difficult to induce an artificial drug resistance in strains maintained in guinea-pigs shows that the natural resistance of the host must be an important factor in the production of this artificial resistance. There is as yet no experimental proof that repeated ineffective treatment of a human case of sleeping sickness with tryparsamide can make the strain resistant to that drug. We know that resistant strains are comparatively common; but as such strains have been isolated from untreated cases in districts where there is no history of sleeping sickness work ever having been done previously it is certain that in many cases this resistance to drugs must be a natural characteristic of the strain.

The question as to whether ineffective treatment in man can make trypanosomes increasingly drug resistant is an important one. An investigation into this point has been started. Experience has shown that quite commonly trypanosomes can be detected in the blood even though patients have had several injections of tryparsamide. In some cases trypanosomes are present up to the seventh or eighth injection and occasionally they can still be demonstrated after a complete course of fifteen injections. An attempt is being made to compare the characteristics of a strain, isolated from a patient before treatment, with those of the same strain isolated after the patient has had a number of injections of tryparsamide. In a series of cases blood



is being injected into clean monkeys before treatment and after the third, sixth, ninth and twelfth injections. If any of the later monkeys show up the strains will be passed into guinea-pigs and their reaction to tryparsamide investigated in these animals. So far we have not succeeded in isolating a strain when once patients have started treatment.

#### (4) THE EFFECT OF CYCLICAL TRANSMISSION.

For a considerable time a *T. brucei* strain isolated from wild fly and a strain isolated from man have been maintained in guinea-pigs by constant cyclical transmission through *G. tachinoides* and *G. submorsitans*. It was noticeably easier to pass the strain isolated from man cyclically through *G. tachinoides* than through *G. submorsitans*. Several times the passage through *G. submorsitans* failed. Admittedly on one or two occasions the numbers of clean fly available were small. At such times the strain had to be recovered from control animals kept going by direct transmission and fresh series of cyclical transmissions started. Eventually it was possible to compare the human strain which had undergone twenty-five consecutive cyclical transmissions through *G. tachinoides*, with the same strain which had had seven consecutive transmissions through *G. submorsitans*. No significant differences were observed and so we have no proof that the species of fly plays any part in determining the characteristics of a trypanosome.

The fact that the human strain seemed much more easily transmissible by *G. tachinoides* than by *G. submorsitans* is interesting. In dissections made in the field infections in *G. palpalis* are usually found to be very scanty whereas they are very much more numerous in *G. tachinoides* an infection rate of twenty per cent being common in the latter species at certain time of the year. Similarly under laboratory conditions it seems easier to transmit strains isolated from man through *G. tachinoides* than through *G. palpalis*. This appears to be an important point and possibly accounts for the divergent views of workers in East and West Africa on the question of non-transmissible strains.

If as it appears, cyclical transmission is easier in one species than in the other then possibly some of the strains which have a low transmissibility by *G. tachinoides* would be non-transmissible by *G. palpalis*, similarly the East African strains, non-transmissible by *G. palpalis* might be transmissible by the other species.

#### (5) ENTOMOLOGICAL WORK.

Dr. T. A. M. Nash, the Entomologist, was on leave during the later half of the year.

His report on the entomological work carried out at Gadau follows :—

Owing to prolonged absence from Gadau it has been impossible to work out results from more than a fraction of the data that have been accumulated. Although tentative conclusions have been reached it is too early to say that they have been proved conclusively.

For nearly two years frequent censuses of the tsetse population have been taken along a track of three and half miles long, which passes through different types of tsetse bush. From these figures the following suggestive results have been obtained :—

At the beginning of the rains the population of *G. submorsitans* starts to increase and reaches its maximum by the end of the wet season. Soon after the dry season begins, the population starts to decrease and from December to April it is at its lowest; numbers do not start to rise again until the rains break. In the main the above also holds good for *G. tachinoides*.



It is noteworthy that these seasonal fluctuations in the size of the fly population of *G. submorsitans* agree closely with the fluctuations observed by the Entomologist in East Africa, showing that a tsetse community does obey laws and that probably in all parts of Africa the fly population is rhythmically rising and falling, following the cycle of the seasons.

These findings furnish a further argument for making anti-tsetse clearings early in the dry season, for besides producing more lasting damage to the vegetation, one is also striking at the tsetse just when the fly community is entering upon an unfavourable season in which the population will be decreasing naturally.

When the fly are caught for the census they are also examined with regard to their state of hunger and sex, and from a data or hunger it appears that among *G. tachinoides* the percentage containing blood is much higher than among *G. submorsitans*, this is probably due to the fact that *G. tachinoides* has a less specialised diet, feeding both on mammals and reptiles, whereas *G. submorsitans* is mainly dependent on the blood of wild game and consequently is not so well fed.

Both species are most hungry in the rains, when the grass is long and food hard to locate, and again in the harmattan season, when the cold overcast mornings reduce their periods of activity, and hence their opportunities of seeking food. Both species are best fed at the end of the dry season, when game is concentrated near their haunts, and yet, though food is so abundant, the tsetse population is then at its lowest, which shows how climate is a far more important factor in tsetse control than abundance of food.

It is well known that in nature about as many males as females emerge from the puparia, so that the community is really composed of about fifty per cent of each sex, yet during the last twenty-two months, among the large number of tsetse which have been caught whilst attacking man, only fourteen per cent of the *G. submorsitans* taken were females as compared with thirty-two per cent females among the *G. tachinoides*. The explanation is believed to be that the females of *G. submorsitans* do not favour human blood, and only take it when driven by excessive hunger this idea is borne out by the fact that the female per cent is only high at those times when the fly examined are showing visible signs of hunger. If this explanation is true (there is further confirmatory evidence), the practical significance of the fact is that in the area investigated only about sixty-four per cent of the total population of *G. submorsitans* are willing to attack man as against about eighty-two per cent of the total population of *G. tachinoides*, hence *G. tachinoides* is probably a more serious menace as a carrier of sleeping sickness. Fortunately this latter species is most easily dealt with by bush clearing.

The mystery of the apparent cessation of breeding for four months in the year during the rains, without the occurrence of any real reduction in the density of the fly population, is on the way to solution. The Entomologist became suspicious that the failure of the collectors to produce puparia in the rains might not be due to a dearth of puparia but to the mechanical difficulty of finding them in the damp humus to which they would adhere. Accordingly, inside a patch of riverine forest where tsetse breed, a shelter was built in such a way as to ensure that the ground covered by it should remain dry throughout the rains.

Fifty-one puparia of *G. tachinoides* were taken from this small dry patch of ground in June and July; the only cessation of breeding was in August, the wettest month, however forty puparia were taken again in September, so that apparently breeding only stops for one



month instead of for four, as previously considered. Further collections from the hut suggest that *G. tachinoides* breeds very freely in October but that reproduction is arrested in December and January when the cold harmattan weather is at its height.

A paper has been published on the results of an experiment upon the longevity of tsetse kept in the shade of a grass hut outside the laboratory. Briefly, it was found that tsetse start dying on days when the maximum shade temperature reaches 103°F, and that when 106°F is attained all flies succumb. These results suggested that possibly even in the dense riverine forest the fly community must be living very near the upper fatal limit of temperature, especially as a temperature of 104°F had been recorded in the riverine forest meteorological station. During the Entomologist's absence on leave, his head native assistant, entirely on his own initiative, started an experiment similar to that carried out in the grass hut outside the laboratory, but this time in the forest. Cages of freshly emerged tsetse were suspended from branches in the shadiest part of the forest and their longevity noted. Flies born in November lived up to ninety-six days, this being the cool time of the year, whereas those hatching in February only lived up to forty-one days, and those for March, when it is really getting hot, only up to seven days. Confirmatory experiments upon the seasonal duration of life are being carried out by monthly liberations of large numbers of marked tsetse; eventually a fair number are recaptured and the age of the oldest individuals is noted.

This research on longevity is tending to show that the patches of riverine forest are not such perfect fly sanctuaries as had been expected, but that the fly just manages, and only just, to survive the climate rigours of the dry season in sufficient numbers to continue the species; it is hoped that further research will show just what alteration is needed to render these sanctuaries violable.

#### SLEEPING SICKNESS SERVICE.

During the year 381,712 people have been examined and 43,017 cases of sleeping sickness diagnosed by the Tsetse Investigation staff. Of these less than 600 cases had been treated previously. Altogether 47,187 cases have been treated this year. This figure includes about 9,000 cases whose treatment had been started in 1933 but does not include about 5,000 cases diagnosed towards the end of 1934. A table giving detailed figures is included at the end of this section of the report.

Throughout the period six fully equipped teams have been at work in the field. Each team consisted of one medical officer, two African nurses and eighteen to twenty-four trained African dispensary attendants. In addition a whole time Medical Officer has been kept at Gadau to run the dispensary and to train African staff. Part of this service has been paid for by Native Administrations. Kano Native Administration paid the full cost of its own team while other Native Administrations subscribed between them £2,000 towards the cost of drugs.

The system of surveys and mass treatment has been continued and has yielded excellent results. In addition considerable progress has been made in the direction of establishing sleeping sickness dispensaries and in the carrying out of protective measures by local communities.

#### THERAPEUTIC MEASURES.

The great majority of cases have been treated with a course of 25-30 grammes of tryparsamide. In working on such a big scale it has been necessary to adopt as simple a routine method of treatment as possible. Adult patients have been given an initial dose of 1 gramme



of tryparsamide followed by 2 gramme doses at five day intervals. In our experience this has been the most satisfactory course of treatment with tryparsamide for use in the field. The cost of the drug and the time taken by the course of injections are important factors and prohibit the use of a larger dosage. We have found that in the field work it is not safe to give larger doses than 2 grammes nor to make the period between injections less than five days. The occurrence of ocular symptoms was much more common when attempts were made to intensify the treatment. Portable stills have been supplied to each team and distilled water has been used for practically all injections. This in itself has caused a great improvement. In the past patients complained of a variety of mild toxic symptoms particularly after the second injection, the time when the adult gets his first 2 gramme dose. It had been noticed that this was a very local occurrence; in some areas nearly all the patients complained of a feeling of malaise going on to headache and fever. In rare instances there was actual diarrhoea and vomiting. As such symptoms only occurred when boiled and filtered local water instead of distilled water, was used for making up the solution of tryparsamide, it is probable that they were caused by changes in the drug produced by chemical impurities in the water. The use of distilled water has completely obviated this difficulty.

Supplies of Antrypol, a British made substitute for Bayer 205 were not available until towards the end of the year. This drug is being packed in 50 gramme bottles and we have had no evidence that there is any deterioration once a bottle has been opened. Samples were tested at Gadau and on small numbers of cases in the field before being used on a large scale. Patients are being given 3 one-gramme doses followed by a course of 9-11 grammes of tryparsamide, with both drugs the interval between injections being kept at five days. Although it would have been possible to give doses of Antrypol at more frequent intervals it was thought inadvisable to introduce unnecessary complications into the scheme of treatment. Where many thousands of people have to attend on the right day to be given intravenous injections by an African staff who from the nature of things can have only very limited European supervision a change in the intervals between injection in the middle of course of treatment might cause serious trouble. By the end of 1934 some 1,700 patients had been treated with this form of combined treatment. A careful watch was kept for any signs of toxic symptoms. It is noticeable that after Antrypol many patients complain of slight pains in their legs and soles of their feet. In some cases this is sufficient to make them limp. However such symptoms are never severe enough to cause them to stop attending for treatment. No serious renal complications occurred and no other deleterious symptoms were observed.

#### THE WORK OF THE SLEEPING SICKNESS TEAMS.

*Team 1.—Zaria Province.*—During the year this team examined 70,757 people and diagnosed 13,494 cases of which the great majority received a full course of treatment with tryparsamide. For practically the whole time an Administrative Officer has been posted to the team and it has been his co-operation that has made work so easy and successful. At the end of 1933 the team moved from Soba district in the centre of the Emirate to Makarfi district about thirty miles further North. Here 38,128 people were examined and 3,807 cases found, an infection rate of ten per cent which was higher than we had expected. In this survey, it was particularly noticeable that where the inhabitants kept to their walled towns and obtained water from wells inside the towns, the infection rate was low, whereas where people had deserted their towns



and made themselves scattered hamlets in the bush the infection rate was very much higher. Two villages Rahama and Nasarawa only three miles away from each other afford a good example of this. Rahama has the lowest infection rate of the district, under three per cent. Nearly all the inhabitants live inside the walls of the town which is surrounded by an extensive belt of cultivated country. There are two streams on either side of it but both are a mile away. Drinking water is obtained from wells within the walls. Nasarawa is situated at the junction of these two streams. Only a small proportion of the population live inside the town and drinking water is obtained from the streams. The area of cultivation immediately round the town is small as the majority of the inhabitants farm further afield. The infection rate here was more than five times as high as at Rahama.

Taking the district as a whole the infection rate for males was 12.5% and that for females 7.6%; the infection rate for children was 8.8% as against 10.5% for adults. Out of the 3,807 cases diagnosed there were twenty-seven deaths either before or during treatment and seven refused treatment. In all 98.5% of the cases received a full course of injections.

From Makarfi the team moved to Paki and Ikara districts which were surveyed together. In Paki 8,384 people were examined and 1,384 cases found, an infection rate of 16.0% in Ikara, excluding the Pala area, 16,466 people were examined and 3,034 cases found, an infection rate of 18.5%. It was again noticeable that the infection rate for males was greater than that for females and the rate for children less than that for adults. Of the total cases 99.2% received a full course of treatment with tryparsamide.

The Anchau district was surveyed next. For the sake of convenience the Pala area of Ikara district, and the Damaru area of Kudaru district were included in this survey. 16,779 people were examined and 5,249 cases found, an average infection rate of 31.3% the highest yet found in Zaria Emirate. Of these cases 99.3% have received a full course of treatment with tryparsamide.

When these figures together with the 16.3% infection previously found in Soba district and the 20.8% in Chawai district are considered the reason for the very serious drop in population which has occurred in the Emirate during the last few years is not hard to find.

*Team 2.—Niger Province.*—Throughout the year the team has worked in Abuja Division. A total of 48,158 people have been examined and 11,731 cases diagnosed. For a considerable part of the time the Medical Officer in charge had the assistance of an Administrative Officer whose work has been of particular value as the team has been dealing largely with Gwari and other pagan races who are somewhat unsophisticated and unused to European medicine.

At the end of 1933 the 2,975 cases diagnosed in the survey of Gerki district were under treatment. Allowing for the few deaths that occurred 99.9% of these completed a full course of treatment with tryparsamide. The team then moved to Ushafa district where 7,780 people were examined and 1,909 cases were found, an infection rate of 24.5%. A sub-treatment team consisting of a nurse and seven dispensary attendants was left to deal with these cases. Excluding fourteen deaths which occurred before and during treatment 99.8% of the cases received a full course of tryparsamide.



While the work in Ushafa district was still in progress the remainder of the team moved to Abuja and using that town as headquarters, surveyed Abuja, Diko and Zulu districts as one unit. This had to be done during the rains and inclement weather often caused delay. In spite of this 31,132 people were examined and 8,182 cases of sleeping sickness found, the infection rate being 26.3%. Among these people there did not appear to be any significant difference between the infection rates in the males and females. There was a very low incidence in young children. The cause of this is not clear as during the first few years of life children are constantly carried by their mothers and so apparently should share the risk of infection. Out of the total number of cases diagnosed thirty-four died twelve before and twenty-two during treatment and thirteen refused treatment. In all 98.8% completed a full course of treatment with tryparsamide.

Although we had the evidence of a preliminary investigation to show that the Southern Districts of Abuja Emirate are infected it was thought best for political reasons to leave the survey of these areas until 1935, so the team moved to the neighbouring Emirate of Lapai. To start with, the Lapai people were suspicious and there was some unrest, many people fleeing from their homes in Lapai town. When once the Emir understood clearly what were the objects of the survey and what was wanted he was able to reassure his people and persuade them to attend satisfactorily for examination. Up to the end of the year 9,110 people had been examined and 1,640 cases diagnosed an infection rate of 18.0%.

*Team 3.—Kano Emirate.*—This team which is paid for in its entirety by Kano Native Administration examined 129,023 people and diagnosed 6,702 cases. The comparatively large number of people examined is accounted for by the density of population and the scantiness of the infection in the first district surveyed. The local Administration gave all the help they could though for the greater part of the year it was not possible to post a whole time Administrative Officer for this work.

At the end of 1933 the treatment of the 2,336 cases found in Dutsi district had been started. A sub-team was left to complete this while the remainder of the team surveyed Kiawa district. Here 51,744 people were examined and only 602 cases discovered an infection rate of 1.2%. There is only a limited amount of tsetse bush in this district and so a low infection rate was hardly surprising, although this was even less than what we had expected. There was ample evidence to show that the neighbouring district of Birnin Kudu would have a considerable higher rate. It was not politic to move the team immediately to Birnin Kudu leaving Kiawa unsurveyed as doing so would have meant the Medical Officer in charge of the team being too far away to exercise a proper supervision of the treatment of the Dutsi cases. Over ninety per cent of the Dutsi and Kiawa cases received a full course of treatment with tryparsamide.

In April the team started the survey of Birnin Kudu district. 59,132 people were examined and 4,529 cases diagnosed at total infection rate of 7.6%. In some localities infection rates of 15% and more were found, but this was counterbalanced by the paucity of infection among the inhabitants of the large walled town of Birnin Kudu and its immediate environs. In all 98.4% of the cases received a full course of treatment.

In December a move was made to Gwaram, the adjacent district. By the end of the month 18,147 people had been examined and 1,631 cases found an infection rate of 9.0%. What is rather surprising is that



the inhabitants of Gwaram itself a large walled town with a population of about 7,000, were infected to the extent of 8.7%. Actually there is a certain amount of tsetse bush quite near the town and in any case many of the inhabitants although living in the town have their farms several miles away.

*Team 4.—Plateau Province—Zaria Province.*—The team started work for the first time in January, 1934 and practically the whole year was spent among the pagan races of Plateau Province. These people are for a greater part very primitive and medical work is often more difficult amongst them than among the more sophisticated mohamadan population of the Emirates. A total of 54,658 people were examined and 3,831 cases found. It was not always possible for a whole time Administrative Officer to be posted for this work but the team did receive as much administrative help as was feasible.

The Shendam, Mirriam, Kwolla, Kanam and Jorto district of Shendam Division were surveyed first. In all 35,738 people were examined and 1,684 cases found an average infection rate of 4.7%. Mirriam and Doka were the most heavily infected districts the infection rates in individual villages varying from 2.5% to 27.8%. Some of the most primitive tribes were very loath to attend for examination and so for political reasons it was thought best not to include their districts in the survey. Preliminary investigations were made in the Southern districts of the Division but significant amounts of sleeping sickness were not found there. Attendances for treatment were not as satisfactory as they might have been; however, 1,501 out of the 1,684 cases diagnosed received adequate treatment which was not a bad result when the character of these pagans is taken into consideration.

From Shendam the team moved to Ganawuri and there made a complete resurvey of the Ganawuri tribes. During the last few years sleeping sickness has caused a very high mortality among these people. According to the Native Administration census figures the total population fell by 1,654 persons during the period 1927-1930. In 1930 a big effort was made to deal with the epidemic and over a thousand cases were treated. Unfortunately very few patients could be persuaded to attend regularly or long enough to receive adequate treatment. In 1931 the total population was counted by an accurate sleeping sickness census. Practically every body was examined and all cases found were given a full course of treatment with tryparsamide. It was noteworthy that the population had only fallen (according to Native Administration figures) by fifty-seven a result which could be attributed both to the removal of the population from their tsetse infested hill villages to fly free areas on the plains and to the treatment carried out the preceding year. In 1932 these tribes were resurveyed as we had evidence that numbers of cases had relapsed and seemed to be resistant to treatment with tryparsamide. Whether this resistance to tryparsamide was a natural attribute of the Ganawuri trypanosome strains or had been acquired through their having been subjected to frequent inadequate doses of the drug during the years when treatment was voluntary is a moot point. The figures of this second survey showed the infection rate to be still high. Number of cases that had received a full course of tryparsamide had relapsed and fresh infection had occurred owing to people being in the habit of returning to their old haunts for farming and for religious rites.

In 1934 the total population was 3,917. Some 1,003 persons gave a history of having had previous treatment at one time or another. Of these 233 were found to be infected while there were 147 new cases. The total infection rate was 9.7%; among cases who had been treated previously the infection rate was 23% while there were 5% new cases.



It is interesting to note that the great majority of the new cases came from villages situated quite close to the forbidden area. Apparently the inhabitants of the villages still persisted in entering the danger zone and this had actually caused the infection rates among them to be higher than ever, though there had been a big fall in the incidence of these in other villages. Considerable care was taken in tracing the subsequent fate of the cases treated in the 1932 campaign. Out of 485 people whose histories could be verified 135 were still infected 267 were cured and eighty-three had died. Allowing 5% for reinfections the following percentages were obtained. Cured 60%, relapsed 23%, died 17% in a period of eighteen months. The real death rate may well have been higher as it is very likely that numbers of the 156 untraced cases may have died.

Figures for this epidemic are given in the accompanying table.

Year.	Popula- tion.	Fall in popula- tion.	No. of cases.	Infection rate.	WITH HISTORY OF PREVIOUS TREATMENT.			NO HISTORY OF PRE- VIOUS TREATMENT.		
					Popula- tion No.	Infect- ed.	Infect- ed rate.	Popula- tion No.	Infect- ed.	Infect- ed rate.
1927- 1930	} —	1,654	over 2,000	25-50%	—	—	—	—	—	—
1931	4,350	57	679	15.6%	1,952	427	20%	2,398	232	%
1932	4,127	223	641	15.5%	—	389	—	—	232	—
1934	3,956	171	380	9.7%	1,003	233	23%	2,914	147	5%

If allowance is made for the number of deaths from sleeping sickness the relapse rate must be a great deal higher than these figures would indicate. Out of the 380 cases found at the latest survey twenty died. Of the remainder 341 completed a full course of treatment which consisted of 4 grammes of Antrypol followed by eleven of tryparsamide. Another ninety-nine cases who were diagnosed on clinical grounds only were given the same treatment. It is to be hoped that the Antrypol will have been effective in sterilising the majority of the tryparsamide resistant cases.

After completing the survey of Ganawuri the team moved to the Southern Division of Plateau Province. The main object was to investigate conditions in Mama district and in the Tin Mining areas of Wamba district with a view to deciding whether it would be safe to open up Mama district to mining. In Mama 5,320 pagans were examined and 400 cases found, an infection rate of 7.4%. If all the pagans who had at one time or another worked as casual labourers on the tin mines had been excluded from the survey the infection rate would have been a great deal lower. As it was, conditions were nearly as bad as in 1932 when the infection rate was 8.7%. There is ample proof that the widespread incidence of sleeping sickness in this part of Plateau Province is largely due to the system of tin mining by which large numbers of pagans, men, women and children are employed in the wet season to dig out tin in the beds of tsetse infested streams. Pagans come in to the mining areas from neighbouring districts, work two or three weeks, long enough to become infected and then return to their homes.

The majority of mining leases are in Wamba district quite close to the border of Mama. An examination of the permanent mines employees showed that out of 377 of them at the various camps 171 were infected an infection rate of 45.4%. As these permanent employees work anywhere and everywhere on the leases, helping to supervise the



pagan casual labour, they serve as a constant source of infection for tsetse, and it is hardly to be wondered at that large numbers of pagan labourers become infected while at work. A survey of the villages from which the greater part of the pagan labour is drawn showed that 400 out of 2,806 villagers were infected a rate of 14.3%. If people who had worked on the mines had been excluded the rate would have been nearer 2%. The position is serious. Here is an epidemic almost entirely due to conditions of labour on the tin mines. Local history relates that in this area sleeping sickness started at the first tin mining camp and that this had to be closed owing to the disease which has spread far and near in the last few years. The local trypanosome strains are of a virulent type. Cases showing marked signs of nervous involvement are comparatively numerous and the people themselves say that the majority of infected cases do not live much more than two years.

Patients in Mama district and among the permanent mines employees were treated with tryparsamide. Later Antrypol was available and so cases among the casual pagan labourers and their families were treated with Antrypol followed by tryparsamide. Attendances were good the great majority of them receiving a full course of treatment. Steps are being taken to regulate the employment of labour by the tin mines and to ensure that all labourers are medically inspected before being taken on by the Mining Companies and again before they are discharged. Any cases found to be infected during their period of employment are to be treated at the expense of the mine owners. Numbers of pagans specially liable to risk of infection are being given prophylatic doses of Antrypol. It is hoped that this experimental prophylaxis with antrypol will serve as a large scale field experiment and will give useful information as to the real value of this type of prophylaxis. (Order in Council No. 6 of 1935 made under the Public Health Ordinance, Cap. 56, applying certain sections of the Ordinance to a portion of the Plateau Province—Gazette Notice No. 235 of 28th February, 1935.)

In December the team moved to Zaria Emirate and started the survey of Lere district. Conditions in Zaria Emirate are such that, it is advisable to concentrate activities there. This team is to work in co-operation with Team No. 1 and we plan that they should deal with adjacent districts in such a manner that while one is doing the survey of one district the other will be doing the treatment in the other. This should be an improvement in that only one Administrative Officer will be needed for two teams. By the end of December 6,500 people had been examined in Lere district and 796 cases found, an infection rate of 12.2%.

*Team 5.—Preliminary Surveys—Sokoto Province.*—In January a start was made with the survey of Madaiki district of Hadejia Emirate. A few cases were found in villages close to the Hadejia River but the majority of the area was completely free. In view of this finding it was decided to utilise the staff for investigating the incidence of sleeping sickness in other parts of the country. The Medical Officer-in-charge, with a small number of dispensary attendants made extensive tours through the southern parts of Gombe and Bauchi Emirates in Bauchi Province, the south-western area of Sokoto Province, and Kontagora Emirate in Niger Province. The results are given below.

*Southern Gombe.*—Infection rates from 2-8% were found in the eastern part of the area in the neighbourhood of the Balaga River.

*Southern Bauchi.*—Infection was found to be widespread, rates from 2-8% being found in villages close to the Gongola and Goji Rivers.



*Sokoto Province.*—The area from the French border to Yelwa along the South Bank of the Niger was found to be fairly heavily infected. Later in the year a thorough mass examination and treatment was carried out; as usual the figures for the preliminary survey were lower than those found by the mass examination.

*Kontagora Emirate.*—No cases were found in the north but the disease was prevalent in the south increasing in quantity the further south the area investigated. Figures were Auna 2-12%, Zuguma district 5-10%, Mushegu district 5-15% and Wushishi district 7-20%.

The team moved to Sokoto Province in August and carried out mass examination and treatment in Illo Independent district, in the Kaoje district of Gwandu Emirate and in parts of Yauri Emirate. In all 28,474 people were examined and 2,405 cases found. During this campaign the team had the service of an Administrative Officer whose help was invaluable in an area where difficulties of communication made work rather difficult. In Illo district 8,999 people were examined and 434 cases were found, an infection rate of 4.8%. There were four deaths among positives, of the remainder 99.9% received a full course of tryparsamide. In Kaoje district 10,733 people were examined and 640 cases found, a rate of 6.0%. Of these there were four deaths but all the remainder received a full course of treatment. Up to the end of December 8,742 people had been examined in Yauri Emirate and 991 cases found, an average infection rate of 11.3%. The treatment of these cases has not been started yet. In all these districts it was obvious that a good deal could be done quite easily by localised protective clearing. The inhabitants were instructed in what wanted doing and the reasons for it and a start has already been made.

*Team 6.—Owerri Province, Southern Provinces.*—At the start of the year the team was employed in treating the 4,713 cases found in the survey of the Abua area of Ahoada Division in 1933. Attendances were on the whole regular and finally about 92% of the infected cases received a full course of treatment. Later the team surveyed the middle areas of the Division and parts of the Northern areas, a total of 50,640 people were examined and 4,073 fresh cases found. The local Administration gave as much assistance as they could but it was not possible to post a whole time Administrative Officer. The Ahoada people are very difficult to deal with. In the Abua area where the disease was very serious and had produced a heavy mortality they were in everyway anxious to obtain medical help. In other areas where both the infection rates and mortality were much less they were apathetic and much time had to be wasted in trying to persuade them to attend for examination and treatment.

In the Abua area 3,218 more people were examined and 854 new cases diagnosed, including last year's cases the average infection for the whole area was 28.5%. In the middle areas of the Division 23,075 people were examined and 2,258 cases found, an infection rate of 9.8%. After some difficulty 97.7% of these cases were persuaded to attend for a full course of tryparsamide. In the Northern areas 14,447 people were examined and 961 cases found, an infection rate of 6.7%.

It was even more difficult to persuade these cases to attend for treatment and finally the campaign was discontinued when 88.7% of them had completed a full course of antrypol and tryparsamide.

#### SLEEPING SICKNESS DISPENSARIES.

As it is not going to be possible to resurvey constantly even the worst areas we are faced with the problem of dealing with the new infections which will be bound to occur after a sleeping sickness team



has left a district. The solution appears to lie in the establishment of dispensaries, with special facilities for the treatment of sleeping sickness. When once an area has been surveyed and all the cases treated the people are thoroughly familiar with the disease and with its treatment and so when fresh cases occur they tend to come in voluntarily to seek medical aid. The way really primitive pagans will trek fifty miles or more into a general medical station to say that they have sleeping sickness and want injections to cure them, is often quite remarkable.

We plan to establish sleeping sickness dispensaries wherever possible in those areas which have been surveyed and treated and where the density of the infection warrants it. Such dispensaries are to be staffed by the dispensary attendants at present working with the teams or by Native Administration dispensary attendants who have been given a special course of training at Gadau. They are to be supervised by the sleeping sickness medical officers-in-charge of the teams possibly assisted in some instances by the medical officer of the area. Eventually each sleeping sickness team would be split up so as to staff fifteen to twenty of these dispensaries. The medical officers-in-charge would spend their time touring from one dispensary to another so as to give adequate supervision, though the actual diagnosis and treatment of patients would be carried out by the African staff who would naturally do as much general medical work as possible.

Early in the year three dry season dispensaries were established, two in Hadejia Emirate at Mama and Guri and the other at Gorgoram in Bedde Emirate. At the onset of the rains they had to be closed as it was not possible for a medical officer to reach them for periodic inspection. They were re-opened again at the beginning of the dry season. The results have been distinctly encouraging. At the Gorgoram dispensary 108 sleeping sickness patients came in voluntarily in the first two and a half months although this was a period in which the people were busy on their farms. The majority of these cases attended regularly to receive adequate treatment.

Plans are being made to open other dispensaries in various parts of the country. By the end of 1934 the building of a number of them had been started. It is hoped that they will be opened early in 1935. By the end of 1934-35 dry season we hope to have an additional nineteen dispensaries in operation, two in Katagum Emirate and one in Ningi Emirate of Bauchi Province, six in Zaria Emirate, five in Kano Emirate, three in Plateau Province and two in Abuja Division of Niger Province. In addition the present staff of the Native Administration dispensaries at Ahoada in Owerri Province and Abuja and Lapai in Niger Province are being sent to Gadau to receive instruction in sleeping sickness work. Later they will return to their own dispensaries. During their period of training their places are to be taken by dispensary attendants loaned from the teams. Arrangements have been made to move the team to the Tiko area of Cameroon Province and work is due to start at the beginning of 1935.

The following table gives a summary of the sleeping sickness work accomplished. In addition to routine duties the teams have done as much general medical work as possible. This has included the treatment of some of the minor ailments and occasional minor operations. It should be realised that apart from its value as a measure directed against sleeping sickness, the fact that people have been brought into contact with the medical staff and with European medicine must of itself make for progress both by popularising the



latter and by causing the people to become more familiar with general European methods and ideas.

Unit.	Locality.	No. examined.	No. of cases.	Infection rate.	No. treated.	Percentage completing treatment.
TEAM 1.	ZARIA EMIRATE:—			%		%
	Makarfi ... ..	38,128	3,807	10·0	3,779	98·5
	Paki ... ..	8,384	1,384	16·6	1,376	98·8
	Ikara ... ..	16,466	3,054	18·5	3,043	99·4
	Anchau, etc. ... ..	16,779	5,251	31·2	5,243	99·3
TEAM 2.	ABUJA DIVISION:—					
	Gerki ... ..	—	Diagnosed in 1933	24·6	2,948	99·9
	Abuja, Diko and Zulu...	31,168	8,182	26·3	8,136	98·8
	Ushafa ... ..	7,880	1,909	24·5	1,894	99·8
	Lapai Emirate ... ..	9,110	1,640	18·0	—	—
TEAM 3.	KANO EMIRATE:—					
	Dutsi in 1933 ... ..	—	Diagnosed in 1933	3·2	2,336	} 90 98·4
	Kiawa ... ..	51,744	602	1·2	597	
	Birnin Kudu ... ..	59,132	4,529	7·6	4,516	
	Gwaram ... ..	18,147	1,631	9·0	—	
TEAM 4.	PLATEAU PROVINCE:—					
	Shendam... ..	35,738	1,684	4·7	1,628	89·1
	Ganawuri ... ..	3,917	380	9·7	352	96·9
	Mama ... ..	5,320	400	7·4	400	} 97·2
	Mines Area—Employees	377	171	45·4	171	
	Pagan Villages... ..	2,806	400	14·3	400	
	ZARIA EMIRATE:—					
	Lere ... ..	6,500	796	12·2	—	—
TEAM 5.	PRELIMINARY SURVEYS:—					
	Sokoto Province ... ..	—	350	—	—	—
	Ilo ... ..	8,999	434	4·8	430	99·9
	Kaoje ... ..	10,733	640	6·0	637	100
	Yauri ... ..	8,742	991	11·3	—	—
TEAM 6.	AHOADA DIVISION:—					
	Abua in 1933 ... ..	—	Diagnosed in 1933	} 28·5	5,486	91·7
	Abua ... ..	3,218	854			
	Middle Areas ... ..	23,075	2,258		2,213	97·7
	Northern Areas ... ..	14,447	961		893	88·7
Hadejia and Bedde Experimental						
	Dispensaries ... ..	—	209	—	209	—
Gadua Dispensary ... ..		—	500	—	500	—
	Totals ... ..	381,712	43,017	—	47,187	—

#### PROTECTIVE MEASURES.

Although the principles involved in protective clearing by local communities and the moving and concentration of population have been accepted, the legal position has been obscure. Sections of various ordinances including the Public Health Ordinance, the Forced Labour Ordinance and the Native Authorities Ordinance are applicable to sleeping sickness work but the exact nature of the powers available and the methods of applying them have not been generally appreciated. In consultation with the legal authorities an effort has been made to clarify the position. It is now proposed that a comprehensive ordinance dealing with all sections of the sleeping sickness work and containing provision for adequate powers to enforce the various measures for its control should be framed and submitted to Government. Such an ordinance is particularly necessary in that existing legislation does not always go far enough and in any case local administrations, although willing to do what that is required are often uncertain how far they can go.

In consultation with the Crown Counsel, Kaduna, regulations under the Forced Labour Ordinance have been drafted to permit of the exactions of unpaid labour for carrying out protective clearings in localities where there is a high incidence of sleeping sickness. They give the conditions under which unpaid labour could be exacted and



the amounts of clearing that such labourers could be called upon to do. They would allow of all vegetation and forest or as much of this as might be directed to be cleared to a depth of one hundred yards from the beds of all rivers, streams, pools or marshes situated within a mile of the habitations of the labourers and within a mile of the place where they draw their water. In addition they would allow of similar clearing to protect roads and trade routes. These regulations have been framed with a view to permitting protective clearing against *G. palpalis* and *G. tachinoides*, no account being taken of *G. submorsitans* as protective clearing against this species is not considered to be an economic proposition in this country. Naturally the suggested limits of clearings are the maxima. Individual localities would have to be studied by their respective administrative and sleeping sickness officers before the people could be told what was required of them. It would be rarely necessary to enforce the full amount of clearing permissible.

The position in some localities was so serious that it was desirable to start clearing this dry season, that is before there was time for regulations to be framed and approved. As an emergency measure Government approved the exaction of labour for protective clearings anywhere in Zaria Emirate and in parts of Shendam, Jos and Southern Division of Plateau Province, such employment of labour to be governed by the pertinent sections of the Anti-Locust regulations. Work has been started already in some districts. Prior to going on leave the Entomologist met a number of Administrative Officers both at Gadau and in the field and gave them short courses of instruction on the principles and methods of making tsetse surveys and of planning protective measures. The Chief Veterinary Officer also arranged for a number of his officers to visit Gadau to receive similar courses of instruction. It is hoped that next year still more of the administrative staff will be able to meet the Entomologist and learn something of this work. In addition he is to visit each team in turn and spend a fortnight or so studying local conditions and reporting on whatever protective measures may be possible and advisable. The presence of the Entomologist with the teams should be particular beneficial in that it will help the individual sleeping sickness medical officers and administrative officers to appreciate the various entomological factors which govern their work and so make it easier for them in the future to plan adequate protective clearings of the right type. Very often medical officers appointed for sleeping sickness duty have no specialised knowledge of anti-tsetse work and little or no previous experience of it. Pressure of work and shortage of staff have always been such that it has not been possible previously to give such officers much training before posting them to a team in the field.

It is realised that measures entailing movement and concentration of population are equally important. Of recent years there has been a very great tendency for people to leave their towns where they are comparatively safe and to settle in scattered hamlets. This scattering of population has meant that they have been much more exposed to attack by tsetse and so has been an important contributory cause of the spread of sleeping sickness. It is clear that something will have to be done to counteract this diffusion of population. Although it is quite easy to move an individual village from a bad site to a better one and this has been done and will be done where necessary, at present there are no legal powers to enforce a wholesale concentration of population such as is being done in other parts of Tropical Africa. The whole question is being carefully studied with the object of remedying this deficiency. Even then the nature of the people and the state of development to which they have attained will make any wholesale concentration of population much more difficult here than it has been in other parts of Africa. However it is quite clear that in some places such measures are the only possible solution of the problem and so they must be an integral part of future policy.



## APPENDIX C.

# Report of the Medical School and Schools of Pharmacy

By GORDON TAYLOR, M.R.C.S., L.R.C.P.,  
*Superintendent, Medical Schools.*

### MEDICAL TRAINING COLLEGE, YABA, AND SCHOOL OF PHARMACY, ZARIA—SUMMARY REPORT FOR 1934.

The following report is submitted in two parts:—

- (A) that dealing with the Medical Training College, Yaba, and
- (B) that dealing with the School of Pharmacy, Zaria.

#### A.—MEDICAL TRAINING COLLEGE, YABA.

1. *Premises.*—The premises in use were the same as those detailed in the Annual Reports for 1932 and 1933, with the following additional buildings which were obtained in April when the Rockefeller Yellow Fever Commission relinquished their research in Nigeria:—

- (a) One block consisting of four rooms, which were converted into a lecture room, laboratory for Histology and Physiology, a preparation room and a lecturer's office.
- (b) One block consisting of two rooms, which are to be fitted up as a studio and preparation room.
- (c) One office block consisting of four rooms.
- (d) One corrugated iron building.

The last two buildings were dismantled and then re-erected in the Medical Training College compound. They now serve as the College office and main store-room respectively. The room formerly used as the College office was temporarily equipped as a laboratory for the preparation of the Ethyl Esters of Hydnocarpus Oil.

2. *Equipment.*—The following additional equipment was received during the year:—

- (a) *Anatomy.*—A few text books.
- (b) *Histology.*—One binocular microscope.
- (c) *Pathology.*—Museum jars.
- (d) *Clinical Medicine and Surgery.*—Text books.
- (e) *School of Pharmacy.*—A few chemicals and drugs. Latest editions of standard reference books. An optical lantern, with some slides of botanical interest. Apparatus for demonstrating the phenomena of light. From the Rockefeller Yellow Fever Commission a number of flasks, test-tubes, beakers, museum jars, etc.

3. *Staff.*—The European staff consisted of the Superintendent, Medical Schools, the Medical Tutor, the Surgical Tutor, and one Pharmacist. The last named was gazetted as from 1st April as Superintendent, Pharmacy Schools. Towards the end of the year one Technical Assistant was transferred to the College from the Laboratory Service.

The Surgical Tutor proceeded on leave on 17th March and resumed duty on 25th October. During his leave he obtained the diploma of F.R.C.S. (Edin.).

The Medical Tutor and the Superintendent, Pharmacy Schools proceeded on leave on 21st July and resumed duty on 25th October.

In addition to their normal duties, the following persons rendered assistance to the College staff :—

Dr. G. M. Gray, Medical Practitioner.  
 Dr. A. B. Aitken, Medical Practitioner.  
 Dr. G. E. Craig, Senior Medical Officer, Lagos Area.  
 Dr. A. J. M. Crichton, Senior Medical Officer, Lagos Area.  
 Dr. E. C. Smith, Senior Pathologist.  
 Dr. B. G. T. Elmes, Pathologist.  
 Dr. W. E. S. Merrett, Pathologist.  
 Dr. J. Cauchi, Medical Officer of Health.  
 Dr. I. L. Oluwole, Assistant Medical Officer of Health.  
 Dr. B. E. Ebdon, Lady Medical Officer.  
 Dr. J. Horne (Mrs. Skutil).  
 Mr. F. W. Randall, Technical Assistant.

Two Second-class Dispensers of the African staff, both Chemists and Druggists, were permanently attached to the School of Pharmacy as teachers. They both proceeded on leave in August and spent their vacation in visiting dispensaries and hospitals throughout the country, and submitted reports which proved of value to the Superintendent of the Pharmacy Schools.

A third Second-class Dispenser was temporarily attached as a teacher until July when, having passed the Chemist and Druggist Examination, he was relieved by another Second-class Dispenser.

A First-class Clerk and a Second-class Clerk assisted in the office and a Second-class Dispenser was attached to the staff for the preparation of Ethyl Esters of Hydnocarpus Oil. Two lecture room attendants and ten labourers completed the staff.

#### 4 *Students.*

(i) *Second Year Medical.*—Throughout the year twelve students attended this class.

(ii) *Third Year Medical.*—Throughout the year fourteen students attended this class.

(iii) *Fourth Year Medical.*—Throughout the year ten students attended this class.

(iv) *Pharmaceutical Students.*—The number of registered pharmaceutical students who were in attendance throughout the year was thirty-six, a decrease of eleven from the previous year. Of this number, six were subsisted by the Government, a decrease of eight from the previous year. Two students were subsisted respectively by the Native Administrations of Kano and Ishan.

As before the pre-medical subjects were taught at the Higher College.

#### 5. *Duties of Staff:*

(i) *Superintendent, Medical Schools.*—The Superintendent, Medical Schools, performed the administrative duties of the College and taught anatomy, surgical anatomy, pharmacology and therapeutics.

He was appointed by the Board of Medical Examiners, established under the Poisons and Pharmacy Ordinance, 1927, to be a member of each of the sub-committees appointed to conduct the following examinations :—

June, 1934.—Dispenser's Examination.

June, 1934.—Chemist's and Druggist's Examination.

He was also a member of the sub-committee appointed to conduct the First Professional Examination for Medical Assistants in January. A separate report from the Superintendent, Medical Schools. is attached.



(ii) *Medical Tutor*.—Before proceeding on leave and after his return from leave, the Medical Tutor lectured in systematic and clinical medicine. He also acted as a Medical Officer at the African Hospital, Lagos. A special report from the Medical Tutor is attached.

(iii) *Surgical Tutor*.—Before proceeding on leave and after his return from leave, the Surgical Tutor conducted classes in systematic and clinical surgery. He also acted as a Medical Officer in the African Hospital, Lagos. A special report from the Surgical Tutor is attached.

(iv) *Superintendent, Pharmacy Schools*.—Before proceeding on leave and after his return the Superintendent, Pharmacy Schools, administered the Schools of Pharmacy, Yaba and Zaria. He conducted classes in organic chemistry and pharmaceuticals for medical students, and lectured to all pharmaceutical students in pharmacy, pharmacognosy, forensic pharmacy, and organic chemistry.

He was appointed by the Board of Medical Examiners, established under the Poisons and Pharmacy Ordinance, 1927, to be a member of the sub-committees appointed to conduct each of the following examinations :—

June, 1934.—Dispenser's Examination.

June, 1934.—Chemist's and Druggist's Examination.

He was also a member of the sub-committee appointed to conduct the First Professional Examination for Medical Assistants in January.

A separate report from the Superintendent of the Pharmacy Schools is attached.

(v) *African Staff*.—The senior Second-class Dispenser conducted classes in inorganic chemistry and until November acted as Secretary to the Board of Medical Examiners.

The junior Second-class Dispenser conducted classes in physics and botany, and the temporary Second-class Dispenser assisted in the dispensary.

(vi) *Honorary Staff*.—The honorary staff during the year conducted classes and performed other duties as follows :—

Dr. G. M. Gray—Consultant.

Dr. A. B. Aitken—Consultant.

Dr. E. C. Smith—Pathology.

Dr. B. G. T. Elmes—Bacteriology and Parasitology.

Dr. W. E. S. Merrett—Physiology and Histology.

Dr. B. E. Ebdon } Midwifery and Gynæcology.  
Dr. J. Horne }

Mr. F. W. Randall—Prepared histological diagrams, and collected and prepared material for the histology class.

6. *Duties of Students*.—As in former years pharmaceutical students assisted in the clearing and tidying of the premises. Under the supervision of the staff they prepared arsenical antidote for officers supervising anti-locust campaigns. They also prepared ointments and dusting powder for the Health Department and dispensed prescriptions for the Yaba Higher College and the Boys' Industrial Home, Yaba.

#### 7. *Classes*:

(i) *Medical Students*.—(a) *Second Year*.—During the year the second year medical students attended classes as shown in the time-table set out in Appendix A of the full report.

(b) *Third Year*.—During the year the third year medical students attended classes as shown in the time-table set out in Appendix B of the full report.

(c) *Fourth Year*.—During the year the fourth year medical students attended classes as shown in the time-table set out in Appendix C of the full report.



(ii) *Pharmaceutical Students*.—During the year pharmaceutical students attended classes as shown in the time-table set out in Appendix D of the full report.

#### 8. *Curricula*:

(i) *Medical*.—(a) *First Year*.—For the last few months of the year the first year medical students received permission from the Principal of the Higher College, Yaba, to attend for a few hours per week for instruction in osteology.

(b) *Second Year*.—During the year the second year medical students attended at the Medical Training College, Yaba, for classes in the following subjects: anatomy, including osteology and embryology; physiology, including histology and chemical physiology; and organic chemistry.

(c) *Third Year*.—During the year the third year medical students attended at the African Hospital, Lagos, for instruction in medicine (clinical and systematic); surgery (clinical and systematic); pathology, parasitology, and bacteriology, and at Yaba for pharmaceuticals, including materia medica, pharmacy, pharmacology and therapeutics; and for surgical anatomy.

(d) *Fourth Year*.—During the year the fourth year medical students attended classes as follows:—

At the African Hospital, Lagos—medicine, surgery and anaesthetics.

At the Health Office, Lagos—public health and tropical hygiene.

At the Infectious Diseases Hospital, Yaba—infectious diseases.

At Massey Street Dispensary, Lagos—midwifery and gynaecology.

At the Medical Training College, Yaba—surgical anatomy.

(ii) *Pharmaceutical*.—The curriculum for pharmaceutical students was revised during the year and was gazetted on the 30th of August (No. 46).

#### 9. *Examinations*:

(i) *Medical*.—*First Professional Examination*.—This examination was conducted in January. Sixteen candidates sat and twelve passed. Copies of the questions are set out in Appendix E of the full report.

(ii) *Pharmaceutical*.—(a) *Dispenser's Examination*.—This examination was conducted in June. Seventeen candidates sat and seven passed. Copies of the questions are set out in Appendix F of the full report.

(b) *Chemist's and Druggist's Examination*.—This examination was also held in June. One candidate sat and was successful. Copies of the questions are set out in Appendix G of the full report.

10. *Vacations*.—In addition to the public holidays the whole College was closed for vacation during the month of August.

During September and October, while the rest of the permanent European staff were still on leave, revision classes were conducted under the supervision of the Superintendent, Medical Schools, and the African staff.

11. *Health of the Students*.—The health of the students was, on the whole, good, several cases of minor ailments being treated at the African Hospital, Lagos, and the Dispensary at Ebute Metta.

All students were vaccinated in February.

12. *Discipline*.—The discipline throughout the year was very satisfactory.



13. *General.*—(i) *Tours.*—The Medical Tutor, the Surgical Tutor and the Superintendent, Pharmacy Schools, proceeded on leave just after a tour of nine months each. The Superintendent, Medical Schools, received permission to do a normal tour of eighteen months owing to the pressure of urgent work.

(ii) *Athletics.*—Football and tennis were as formerly favoured past-times. Matches in both games were played with the Yaba Higher College and with Igbobi College. Four lawn tennis courts were constructed by private subscription and a cricket pitch and badminton courts are at present in the course of construction.

14. *Special Reports.*—(a) *Surgical Tutor's Report.*—During 1934, the teaching of surgery was carried out along the same lines as in the previous year. During 1934, however, two classes of students—a third year and a fourth year—had to be dealt with. It was not found possible to give the third year students as much experience in the out-patient dressings rooms, etc., as their predecessors enjoyed. During the greater part of 1934, the Surgical Tutor was absent on leave, and although the teaching was ably carried out in his absence by Dr. Horne and Dr. Ellis, there has inevitably been a certain amount of discontinuity.

(b) *Report on Bacteriology and Parasitology:*

*Bacteriology.*—The course commenced in March and ended in June. A class examination was held in July. Thirty-four lectures were given and about twenty hours devoted to practical instruction and demonstrations. The ground covered is indicated in the syllabus, which was based upon this course.

*Parasitology.*—Seven lectures in this subject were delivered in June and September but owing to pressure of other duties it was not possible to complete the course. Parasites were demonstrated to the class whenever possible but they had very little practice in the examination of material. No class examination was held.

*Remarks—Premises.*—A properly equipped laboratory for practical work is an urgent need. At present one end of the museum is used but the space will be encroached upon as the museum grows.

*Lectures.*—As no standard text books have been adopted notes covering the essentials in these subjects were dictated to the students. A reasonable standard for medical assistants has been aimed at but it is felt that those returning to sit for the diploma should receive further instruction. Discipline has been satisfactory and attendance regular.

(c) *Medical Tutor's Report.*—This Report covers from January, 1934 to February, 1935, when the general duties of the Medical Tutor were similar to those outlined in section 14 (a) of the Report for 1933. One's chief responsibilities were centred in the teaching of systematic and clinical medicine, with the charge of four wards in the African Hospital—two general wards for female patients and children, and two medical wards for males, a total of about sixty beds and ten cots. This combination of duties as clinician and tutor is a distinct advance on former methods of working. Unfortunately, from the students' point of view, instruction under supervision in the out-patients' department is still lacking, and the only solution one can see for this defect is the appointment of at least two Medical Officers of such experience as could handle students without loss of efficiency in running this most important department of the Hospital. In the meantime, it is hoped that the Medical Assistants (when qualified) will gain experience in out-patients' work during the two years of otherwise very fully occupied time that they will serve as House-men in the hospitals to which they will later be attached. The teaching course was divided into a Senior Class of ten students, and a Junior Class of fourteen students from January, 1934 onwards. The 1934



time-tables were arranged so that the students were under the Medical and Surgical Tutors, more or less on alternate days; but this proved to be a disconnected and unsatisfactory plan. Since the new time-tables for 1935 have been arranged, the students are alternately under the Medical Tutor for half the academic year in their Junior Course, and then under the Surgical Tutor for the other half of the year; thus completing junior medicine and surgery in their third year of study. The teachers are thus dealing with a succession of junior and senior students each year: and this will greatly help to define clearly the length and substance of the actual courses, which have not as yet been completed. The material taught was practically in accordance with that set forth in the prospectus which is now published; and it was arranged as indicated therein, for the reasons given in section 14, paragraph (a) 2 of the typed Report for 1933. The Course in systematic medicine included eighty-four meetings of the class as Juniors (during 1933), and was completed in another fifty-one Senior lectures during 1934—making a grand total of 135 lectures. This has been used as the foundation of requirements for a complete lecture course as set forth in the Prospectus (which shows a total of 136 lectures over two years). The method of teaching continues to be mainly by dictated synoptical notes, with a “running commentary” of an explanatory nature along with frequent questioning of the students in the class-room and clinics. Text-books are merely mentioned as books of reference for clearing up details which the student may have failed to grasp in his lecture-notes.

The general tone in the present (1935) class of Senior students is poor, their general intelligence and ability to learn is definitely below that of the former students. Discipline also requires to be strictly enforced on account of the unfortunately presumptuous attitude of certain individuals. The present Junior Class (1935) is easily the best set of students that we have had so far, in discipline, general behaviour and even in physical fitness: nevertheless they are also rather disappointing in their tardy application of what they have been taught in class-room and clinic.

(d) *Report on Anatomy*.—Owing no doubt to a severe harmattan season, several papier maché anatomical models suffered deterioration. It was possible in some cases to make temporary repairs.

A few parts of the limbs, having been very carefully dissected, are being preserved as museum specimens.

Three female and two male subjects were received for dissection during the year. With one exception, these were excellent subjects.

It has been found that some of the abdominal and thoracic organs tend to become pulpy after their removal from the body. No disinfectants, not even formalin, would appear to prevent this change.

(e) *Report on the School of Pharmacy, Yaba*.—The year commenced with thirty-six students who were divided into first, second and third year classes. The staff consisted of the Superintendent, Pharmacy Schools, and three African Second-class Dispensers. One of the latter was attached temporarily in order to read for the Chemist's and Druggist's Examination, the other two having passed this examination previously.

The subjects taught in the School of Pharmacy were inorganic chemistry, organic chemistry, physics, botany, pharmacy, pharmacognosy, prescription reading and forensic pharmacy. In addition, classes for medical students were conducted in organic chemistry and pharmaceutics and a series of tutorials in all subjects were conducted for the Second-class Dispenser who was studying for the Chemist's and Druggist's Examination.

Apart from this heavy programme of teaching several additional duties were undertaken.



Having so many subjects to teach to three classes the African staff were given the opportunity to specialise in one or two subjects. The senior man took over the entire teaching of chemistry and the junior man was made responsible for physics and botany. To both these men the Superintendent is grateful for much diligent and conscientious work, both inside and outside of official hours.

With very few exceptions the students worked hard during their thirty-four hours per week in class, and in their own homes. Unfortunately, however, with the inception of the Medical School, the pharmaceutical profession can no longer draw on the best type of man and in consequence many of the students appeared to be unable to absorb the knowledge so laboriously thrust upon them. Examinations usually showed that principles were not understood and that facts tended to be jumbled, garbled and unclassified. With the material available the staff were made to feel discouraged and tended to the opinion that their efforts were largely wasted. This prevailing pessimism was not without its justification. Previous experience had shown that the African can grasp principles and facts and apply these to professional problems. A few of the present students may eventually qualify as dispensers; a number will certainly never do so.

As in former years the pressure of other duties prevented any research work or investigations being undertaken. There is much that could be done in various fields, particularly in the examination of native drugs, the preparation of tablets, the manufacture of ethyl esters of hydnocarpus oil, etc., etc., but for all of these, time is the first essential.

Throughout the year, athletics were of a desultory nature. The senior member of the African staff, himself a fine footballer, attempted to raise enthusiasm among the students but invariably met with failure. In this connection it has been shown elsewhere that little can be done with "day-boys" so far as athletics, character-training and discipline are concerned. This is amply confirmed by our experience.

This is a pessimistic report, but it is the result of the experience of five and a half years. The Pharmacy School reached its zenith about two years ago and the decline has now set in. No amount of thought and diligence on the part of the staff can retrieve the former glories, unless and until the profession of pharmacy offers a career which is comparable, and favourably comparable, with the best that is offered elsewhere.

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#### B.—SCHOOL OF PHARMACY, ZARIA.

##### *Summary of Annual Report, 1934.*

The year 1934 under review closed with a tinge of pessimism as to the future of the School of Pharmacy, Zaria. There were no entrants during the year, and 1935, as yet holds no prospects of fresh students. Great difficulty was found in obtaining posts for those students who were qualified. The financial position of the country resulted for the time being, in the closure of the main avenue of employment for which the school was originally opened. Some candidates were offered and accepted posts under Native Administrations. The result appears to be that the remaining avenue of employment in the north, that of Native Administration, which could normally have supplied the school with students for a further period of three years is filled. At the time of writing the school seems doomed for closure in 1936 solely due to lack of students.



1. *Premises*.—No large alterations or additions were made to the building. A demonstration bench in the main lecture room was fitted with sink and drain pipe; water and gas were connected to it. Extra shelves were fitted in the laboratory to hold reagents.

2. *Staff*.—The European staff consisted of an Assistant Superintendent. At the beginning of the year there was one Second-class Dispenser of the African staff, but in May a further addition was made by the appointment to the school of a Second-class Dispenser who had been trained in the school. The school grounds were kept tidy by a gang of six labourers.

3. *Duties of Staff*.—The Assistant Superintendent was responsible for the administration of the school. Before proceeding on leave and after his return he conducted the main lectures in botany, physics, chemistry, pharmacy, pharmacognosy, prescription reading and forensic pharmacy to second year students and coached African staff for the Chemist and Druggist Examination. He was appointed by the Board of Medical Examiners to be a member of the sub-committee to conduct the Dispensers' Examination in June at Zaria.

The Senior African member was responsible for conducting the revision classes for students resitting the examination in June and January, 1935. During the absence on leave of the Assistant Superintendent, he was left in charge of the school.

The junior member of the African staff assisted in classes with the second year students. Under the guidance of the Assistant Superintendent, he conducted a practical work in all subjects. He gave revision lectures in prescription reading and forensic pharmacy. He erected demonstration apparatus for use in lectures and performed a variety of clerical duties. During the absence on leave of the Assistant Superintendent, he conducted a revision course with the second year students.

Both members of the African staff attended classes given by the Assistant Superintendent on physics, botany, chemistry and pharmaceuticals of a higher standard, with the view of sitting for the Chemist and Druggist Examination. The senior member sat the June examination and was successful. The junior member is working for the examination in January, 1936.

4. *Students*.—At the commencement of the year there were eight second year students, seven revision students and three dispensers qualified from the previous November and awaiting appointments. One student in his second year was subsisted by Kano Native Administration. All others by Government.

(i) *Second Year Students*.—Second year students attended classes in accordance with the time table given in Appendix H of the full report. Although these students will sit their final examination under the 1927 regulations, the syllabus adopted throughout the course has been that of the regulations gazetted this year. The result is that the course is in line with recent developments in medicine and the extra interest for both students and staff have fully warranted this procedure.

(ii) *Revision Students*.—Revision students attended classes in accordance with the time table in Appendix H of the full report. One was dismissed from the school for general inefficiency and joined the Kano School of Sanitation in April. The remaining six sat the June examination and four qualified. The two candidates who failed continued preparation for the January examination. The four newly qualified dispensers remained at the school on subsistence.



(iii) *Dispensers awaiting appointment*.—The three dispensers awaiting appointment at the commencement of the year and joined by four more in July were kept fully occupied. A rota was arranged with the Senior Medical Officer, Zaria, for them to attend at the Sabon Gari Dispensary and the Zaria Hospital at definite times. Experience in clerical work was given at the School of Pharmacy. One dispenser occupied his time by working for the Chemist and Druggist Examination. Four dispensers were during the year appointed to Native Administration posts and one was given a Government post and joined the school staff. The two remaining are still at the school.

5. *Duties of Students*.—As in previous years, students assisted in cleaning and tidying their premises. They also prepared a considerable number of special injections, infusions and powders for use in the African Hospital.

6. *Teaching Method*.—In all subjects brief notes were dictated, these were fully explained with running commentaries and frequent tutorial revision. Oral, written and practical tests were performed at frequent intervals and students attended terminal examinations in April, July and December. The results were recorded with brief reports upon the progress of each student.

7. *Discipline*.—The discipline has been satisfactory throughout the year. At times resident students have been severely reprimanded regarding the occasional untidy state of the hostel, the chief trouble however is due to students' wives. A considerable amount of discord was produced when qualified students heard that no Government posts were available for them. In course of time they were philosophical enough to accept the lower paid Native Administration posts. The feeling that they were all being intentionally debarred from Government posts was dispelled upon the appointment of one to the school staff.

8. *Games*.—Games were compulsory during the year. A fair amount of keenness was shown. One cricket match was played against Zaria European eleven and three football matches were played.

9. *School Garden*.—A School Botanical and Drug garden, after considerable experimenting in previous years has been fairly successful this year. Good specimens of many drug plants were obtained. The specimens proved valuable material for the teaching of botany and pharmacognosy.

10. *General*.—On July 31st before the closing of the school for the annual holiday, the four successful students at the June examination were presented with certificates of examination by the Resident, Zaria Province, the District Officer and the Emir of Zaria with a number of African visitors were present. The opportunity was taken to explain in Hausa the work of a dispenser in the medical service of the country. After the distribution of the certificates by the Resident, the school was opened for inspection by visitors.

Photography has been encouraged during the year as a suitable hobby for students, a number of special lectures have been given by the Assistant Superintendent on the chemistry of photography, developing of films, printing, indoor photography and enlarging. Students have displayed a considerable amount of keenness and their technique has improved.

The school was visited during the year by a number of people among whom were the Resident of Zaria, the Emir of Zaria, and the Director of Medical and Sanitary Service.

## APPENDIX D

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### Report of the Dietetics Research

By J. G. S. TURNER, D.P.H., B.Sc., D.T.M.,  
*Medical Officer of Health.*

#### DIETETICS RESEARCH LABORATORY.

1. *Staff*.—The staff distribution throughout the year was as follows:—

- (a) *Permanent*.—Dr. J. G. S. Turner, 1st January, 1934 to 21st July, 1934; Mr. D. C. Lorimer, 1st January, 1934 to 2nd February, 1934 and 28th June, 1934 to 31st December, 1934; Mr. O. I. Oyoyoh, 1st January, 1934 to 23rd March, 1934 and 7th May, 1934 to 31st December, 1934.
- (b) *Temporary*.—There have been changes in the temporary staff owing to the removal of the laboratory from Katsina. Mallam Wallis Dan Sarkin Katsina was unable to accompany the laboratory for personal reasons and I take this opportunity to record the excellent service he has rendered during the past four years.

2. *Summary of Events*.—The first meeting of the Dietetics Committee (Southern Provinces) was held at Enugu early in January. Further work was carried out on the possibility of preparing a vegetable milk but the results are generally unsatisfactory. Detailed examination of the school population in Katsina was made and for comparative data a visit was paid to some of the Plateau pagans. The second half of the year saw the removal of the laboratory from Katsina to Zaria.

3. *Dietetics and Animal Health Committees*:

- (a) *Animal Health*.—No meeting was held.
- (b) *Dietetics (Northern Provinces)*.—No meeting was held but individual contact was maintained with the various members.
- (c) *Dietetics (Southern Provinces)*.—A successful meeting was held at Enugu early in January, under the chairmanship of the Secretary, Southern Provinces. The practical outcome of the meeting is as follows:—
  - (i) An investigation has been commenced into the syndrome studied by Fitzgerald Moore and no doubt practical measures will be evolved to combat the trouble.
  - (ii) The Education Department have greatly assisted by collecting data on the height, weight, age and physical condition of pupils in a large number of schools scattered over the Southern Provinces. The data have not yet been analysed but I hope to undertake this work shortly.
  - (iii) The Education Department have also collected equivalent names for many of the foods in the south in the principal languages.



- (iv) The Agricultural Department have sent a variety of maize specimens for an opinion as to their vitamin A content.

4. *Nutrition and Physique*.—The school population of Katsina were examined in conjunction with Dr. Sorley and it was noted that the Pelidisi and A.C.H. indices corresponded closely with personal judgments. The results of the examination indicate that approximately fifty per cent of pupils attending the schools in Katsina are below normal in nutrition and physique. This percentage was fairly constant from the elementary school to the higher college. It was noted that there was some improvement in the middle school in those who had been resident for more than one year.

A tour was made amongst some of the pagan tribes in the Plateau and the percentage of boys and girls reaching normality was from seventy to eighty per cent. The pupils in the school examined showed the lowest percentage of normals (seventy per cent) and the highest percentage of well below normals. It is probable that there is some selection of children of poor physique in the schools.

It is difficult to attribute the difference in nutrition between the two groups to any other cause than diet. Venereal disease is not an important factor until adult life and sanitary conditions and worm infestation are similar in the two groups. It seems that the pagan superiority is due to their lack of scruple as to their source of protein and also to the fact that beniseed forms part of the daily diet. Beniseed contains a good protein and it is interesting to note that this is one of the few areas where red palm oil is available and appreciated. Fertility is high on the Plateau ten to fifteen pregnancies being normal. There is also an exceedingly high infantile mortality which varies from 400-800 per 1,000. Goitres are very frequent amongst Rukuba females (sixty per cent of females over puberty) and relatively rare among men. It would seem that the goitres are associated with excessive sexual activity as the Rukuba until recently had as many as five or six miscarriages before marriage and as many normal pregnancies afterwards. It will be interesting to note if changed social conditions will abolish the goitres.

5. *Analyses*.—Analytical work in the earlier part of the year was confined to vegetable milks but at the beginning of the wet season a beginning was made in the analysis of meat samples. The results indicate the very poor quality of the animals slaughtered as the fat content rarely exceeds one per cent in meat free of obvious fat, as against about ten per cent in European average samples. The fat in organs is higher but is only about half that for the same average samples. The analyses will be extended and repeated during the dry season when the animals are in their worst condition.

The analysis of staple foods is now almost completed and a start has been made on the analysis of famine foods and foods of secondary importance. It is proposed also to repeat analyses on local varieties of the staples as they show often considerable variations in mineral content.

6. *Biological resting of Foods*.—The following foods have been examined :—

- (a) *Green Gram*.—Experimental work was continued from the previous year and it was found that cooking greatly improved the quantity of the protein.

Normal growth was obtained when the protein of green gram was fed at. Eighteen per cent level. It was concluded that the eye lesions previously noted were due to a bad sample of Cod Liver Oil.



- (b) *Dan Alakos (Cowpea)*.—This variety of cowpea is one of the staples in Katsina and also generally over the north. The results indicate that cooking is essential as the uncooked food will not support growth. The protein is comparable to that of groundnuts in promoting growth in young animals over the period tested (seventeen weeks).
- (c) *Acha*.—This grain is used as a staple by the pagans. Experimental work was discontinued before results were available owing to the removal of the laboratory. The white variety of acha can be recommended as a very good substitute for porridge and also for milk puddings.
- (d) *Beniseed*.—Growth records were obtained for comparative purposes. It was found that the protein was equal in quality to that of groundnuts.

7. *Stock Animals*.—The stock animals have been living on a wholly vegetarian diet (except for a small addition of milk) for almost four years and breeding and maximum growth are normal. Litter size averages 10-12.

8. *Vegetable Milk and Oil Seeds*.—The further work done indicates that vegetable milks are unsuitable except for large institutions where skilled control is available. The production of a milk powder complete in all essentials and ready for solution would entail a cost which would place the product beyond the reach of the poor people for whom it is intended. A modified milk prepared from groundnut flour is being used by a mission hospital in the Congo. The formula given is not very satisfactory but it is claimed that infants can be reared by its use. The essential process is to extract protein from oil seed at a temperature not exceeding 60°F and to add a mineral mixture to render the extract similar in composition to that of cow's milk. All the oil seeds available in Nigeria have been tested and the groundnut is the only one which holds any promise of success. Beniseed makes a better milk in chemical composition but some bitter principle is present and renders the extract undrinkable.

It is possible that some use might be found for groundnut flour as the protein is of good quality. A twenty-five per cent mixture with ordinary flour makes a good bread capable of sustaining life and growth. It would be worth while attempting to find possible use in native cooking.

9. *Removal of Laboratory*.—The laboratory was moved from Katsina to Zaria in the remarkably short period of three weeks. The site in the African Hospital compound is very suitable and the buildings are more convenient and of a more permanent character than those in Katsina. Rail transport is available and owing to its central position Zaria is an excellent touring centre. A wide selection of both northern and southern foods is available in the local markets. The laboratory is now in full working order and the vegetable garden is already yielding a good crop of green food for the animals.





